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Report on the individual review of the annual submission of Iceland submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of Iceland, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 28 August to 2 September 2017 in Reykjavík, Iceland.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

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Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
Annex I Party	Party included in Annex I to the Convention
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation/reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
C	carbon
CER	certified emission reduction
CH_4	methane
CLRTAP	Convention on Long-Range Transboundary Air Pollution
CM	cropland management
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
CSC	carbon stock change
DOM	dead organic matter
EA	Environment Agency of Iceland
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
F-gas	fluorinated gas
FAO	Food and Agriculture Organization of the United Nations
FM	forest management
FMRL	forest management reference level
GHG	greenhouse gas
GM	grazing land management
H_2S	hydrogen sulfide
HFC	hydrofluorocarbon
HWP	harvested wood product
IE	included elsewhere
IEF	implied emission factor
IFR	Icelandic Forest Research
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LULUCF	land use, land-use change and forestry
N	nitrogen
NA	not applicable
national system guidelines	"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol"

MCF	methane conversion factor
NCV	net calorific value
NE	not estimated
NEA	National Energy Authority of Iceland
Nex	nitrogen excretion
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
NOx	nitrogen oxides
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulfur hexafluoride
SIAR	standard independent assessment report
SOC	soil organic carbon
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
VS	volatile solids
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of Iceland organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 28 August to 2 September 2017 in Reykjavík and was coordinated by Mr. Pedro Torres (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of Iceland.

Table 1
Composition of the expert review team that conducted the review of Iceland

Area of expertise	*Name*	*Party*
Generalist	Mr. Marcelo Rocha	Brazil
Energy	Mr. Darío Ruben Gómez	Argentina
IPPU	Mr. Stanford Mwakasonda	United Republic of Tanzania
Agriculture	Mr. Steen Gyldenkærne	Denmark
LULUCF	Ms. Sekai Ngarize	Zimbabwe
Waste	Mr. Mikael Szudy	Sweden
Lead reviewers	Mr. Rocha	
	Mr. Gyldenkærne	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that Iceland resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, the encouragements of the ERT to Iceland to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Iceland, which provided no comments.

4. Annex I shows annual GHG emissions for Iceland, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for Iceland.

5. Information to be included in the compilation and accounting database can be found in annex II.

[1] At the time of publication of this report, Iceland had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

II. Summary and general assessment of the 2017 annual submission

6. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2
Summary of review results and general assessment of the inventory of Iceland

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
Dates of submission	Original submission: 12 April 2017 (NIR), 13 April 2017, Version 5 (CRF tables), 14 April 2017 (SEF-CP1-2016), 24 April 2017 (SEF-CP2-2016) Revised submissions: 5 May 2017 (NIR), 31 August 2017, Version 6 (CRF tables), 24 April 2017 and 17 May 2017 (SEF-CP1-2016) Unless otherwise specified, the values from the latest submission are used in this report		
Review format	In-country		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	E.6, E.7, E.15, E.20, I.14, A.12, A.22, A.23, A.24, L.4, W.12
	(c) Development and selection of EFs	Yes	E.21, E.23, E.24, A.14, A.15, A.20, A.21, L.18, L.19, L.21, W.13
	(d) Collection and selection of AD	Yes	G.2, E.27, I.15, A.9, A.16, A.19, L.7, L.8, KL.11
	(e) Reporting of recalculations	No	
	(f) Reporting of a consistent time series	No	
	(g) Reporting of uncertainties, including methodologies	Yes	G.8, E.17, L.14, KL.7
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	E.26, E.27, I.11, I.13, A.4, A.5, L.5, L.9, L.11, L.12, L.13, L.17, L.22, W.8, KL.10
	(j) Application of corrections to the inventory	No	

Assessment			*Issue or problem ID[a](s) in table 3 and/or 5[b]*
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	Yes	E.31, A.1
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	Yes	G.5, G.6
	(b) Performance of the national system functions	Yes	G.5, G.6, G.7
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	Yes	G.3
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	No	
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.1, KL.3, KL.6, KL.8, KL.9, KL.10
	(b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.8, KL.10
	(c) Reporting requirements of decision 6/CMP.9	No	
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex,	Yes	KL.8

Assessment			*Issue or problem ID[a](s) in table 3 and or 5[a]*
	paragraphs 33 and 34		
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	No	A.23
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Questions of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in the energy, IPPU, agriculture and LULUCF sectors, for KP-LULUCF activities, and of a general nature that are not listed in this table but are included in table 3 and/or 5.
[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 29 March 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Iceland

ID[a]	*Issue and or problem classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	CRF tables (G.3, 2016) Transparency	Include in CRF table 9 information on the use of "NE" and "IE" notation keys.	Resolved. Iceland provided information on the use of notation keys in CRF table 9.

[4] FCCC/ARR/2016/ISL.

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.2	Inventory planning (G.1, 2016) (G.1, 2015) (12, 2014) (12, 2013) Accuracy	Ensure that one organization has a full understanding of the complete energy balance and can compile a transparent and complete energy balance.	Addressing. A new regulation (520/2017) on data collection and institutional information related to Iceland's inventory of GHG emissions was approved in June 2017 and is being implemented (see ID#s E.1 and E.5 below, and ID#s G.5 and G.6 in table 5). This regulation includes a provision that NEA shall provide an energy balance to EA. It is the ERT's view that to resolve the issue the changes in the regulation need to come into effect.
G.3	National registry (G.4, 2016) Reporting under Article 7, paragraph 1, of the Kyoto Protocol	Include in the national registry disaster recovery plan information on: the roles and responsibilities of primary and alternate registry personnel in disaster recovery; a communication procedure for the contingency plan; documentation for registry operation in a crisis situation; a periodic testing strategy based on procedures agreed with the registry host; and the time frame in which the registry could resume operations following a disaster.	Not resolved. During the review, Iceland presented additional information on the national registry disaster recovery plan. Iceland informed the ERT that all the elements requested in the recommendation from the previous ERT will be submitted to the secretariat.
G.4	National system (G.2, 2016) (G.2, 2015) (98, 2014) Reporting under Article 7, paragraph 1, of the Kyoto Protocol	Report in the annual submission any changes in the national system in accordance with decision 15/CMP.1, annex, chapter I.F, and/or further relevant decisions of the CMP.	Addressing. During the review, Iceland explained that a new regulation (520/2017) on data collection and institutional information related to Iceland's inventory of GHG emissions was approved in June 2017 and is being implemented (see ID# G.5 in table 5). Iceland further explained that any changes in the national system related to the new regulation will be presented in the next annual submission.
Energy			
E.1	1. General (energy sector) (E.1, 2016) (E.1, 2015) (19, 2014) Accuracy	Work with the Icelandic Directorate of Customs to correct the errors related to reporting of AD in the 2014 annual submission; for example, where coke was recorded as coal, and where coking coal was recorded as coke.	Resolved. These fuels are used for non-energy purposes and therefore the associated AD are relevant only for reference approach verification purposes. During the review, the staff from NEA confirmed that the non-energy use of fuels is reported in the national energy balance. This information will be provided to the inventory team on an annual basis in the context of the new regulation 520/2017.
E.2	1. General (energy sector) (E.2, 2016) (E.2, 2015) (21, 2014) Transparency	Report information on electrode consumption, steam coal consumption and petroleum coke consumption that provides justification for significant inter-annual changes and gaps in the time series of fuel consumption and associated emissions.	Addressing. During the review, Iceland informed the ERT that this issue has been considered and that an improvements plan and a timeline for the plan will be made after the in-country review in cooperation with an external consultancy.
E.3	1. General (energy	Provide transparent information	Addressing. During the review, Iceland informed

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	sector) (E.3, 2016) (E.3, 2015) (22, 2014) Transparency	in cases where GHG emissions have been accounted for elsewhere and the notation key "IE" is used to report such emissions.	the ERT that the use of liquid fuels under non-metallic industries and the associated CO_2, CH_4 and N_2O emissions have been reported under solid fuels. This constitutes the only case for which the notation key "IE" has been used in the sectoral approach but is not described in CRF table 9. Iceland further indicated that: (1) AD for this subcategory have already been disaggregated into liquid and solid fuels; (2) the emissions from liquid fuels will be correspondingly reported in the next annual submission; and (3) the notation key "IE" will no longer be needed.
E.4	1. General (energy sector) (E.4, 2016) (E.4, 2015) (23, 2014) (21, 2013) Transparency	Provide more transparent information on the modification methodologies used when recategorizing the data received from NEA.	Addressing. During the review, Iceland informed the ERT that recategorization only concerns the values of diesel oil and fuel oil sales reported by NEA under energy industries, industry, house heating and swimming pools, and other. These values were disaggregated by the inventory team according to the IPCC subcategories electricity production (1.A.1.a), manufacturing industries and construction (1.A.2), commercial/institutional (1.A.4.a) and residential (1.A.4.b). Iceland further indicated that an energy balance is reported annually by NEA to the International Energy Agency and Eurostat. This energy balance will be made available to EA as stipulated in regulation 520/2017 (see ID# E.5 below and ID# G.5 in table 5). During the review, NEA and EA exchanged views on: (1) the transfer by NEA of this energy balance to EA; (2) the assessment by EA on whether this energy balance provides final consumption data disaggregated in a manner consistent with IPCC categories; and (3) the need for further guidance from EA to NEA if the disaggregation in the energy balance is not sufficient.
E.5	1. General (energy sector) (E.5, 2016) (E.5, 2015) (23, 2014) Comparability	Consider the possibility of redefining the coordination agreement between NEA and EA in order to change the data collection process by preparing a data collection template that is consistent with the IPCC categories.	Resolved. The coordination agreement is no longer needed as it has been superseded by the new regulation 520/2017 (see ID# G.5 in table 5). For the energy sector, this regulation specifies, inter alia, that NEA shall: (1) collect and submit in a timely manner to EA fuel consumption data to estimate GHG emissions arising from IPCC stationary and mobile combustion categories; (2) provide information on geothermal energy; and (3) provide an energy balance. In addition, both EA and NEA will undertake the uncertainty assessment and QA/QC checks of the corresponding data and ensure that the data and procedures are in line with the 2006 IPCC Guidelines.
E.6	Fuel combustion – reference approach – liquid and solid fuels – CO_2	Correct the apparent consumption in units of energy for the entire time series by using an appropriate conversion factor,	Not resolved. Iceland is planning to tackle this issue with the information provided by NEA to EA, in particular the energy balance (see ID# E.5

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	(E.16, 2016) (E.16, 2015) Accuracy	and report the corrected estimates in CRF table 1.A(c).	above).
E.7	Fuel combustion – reference approach – liquid and solid fuels – CO_2 (E.17, 2016) (E.17, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Estimate and report stock changes of liquid (gasoline, jet kerosene, gas/diesel oil, residual fuel oil and liquefied petroleum gas) and solid (other bituminous coal) fuels in CRF table 1.A(b) for the entire time series.	Not resolved. Iceland is planning to tackle this issue with the information provided by NEA to EA, in particular the energy balance (see ID# E.5 above).
E.8	Fuel combustion – reference approach – liquid and solid fuels – CO_2 (E.18, 2016) (E.18, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report estimates for the apparent energy consumption (excluding non-energy use, reductants and feedstocks) of liquid and solid fuels for the entire time series in CRF table 1.A(c).	Addressing. Improvements were made in the 2017 annual submission as Iceland reported apparent energy consumption (excluding non-energy use, reductants and feedstocks) for liquid and solid fuels in 2014 ("NO" was still reported for solid fuels in 2012–2013). Iceland is planning to further tackle this issue with the information provided by NEA to EA, in particular the energy balance (see ID# E.5 above).
E.9	International aviation (E.8, 2016) (E.8, 2015) (27, 2014) (27, 2013) Accuracy	Improve the differentiation of fuel consumption between international and domestic aviation.	Resolved. During the review, the NEA officer in charge of the national energy statistics confirmed that the data collection is done in accordance with the departure and arrival airports of each journey, which is in line with the 2006 IPCC Guidelines.
E.10	International navigation (E.9, 2016) (E.9, 2015) (28, 2014) (28, 2013) Accuracy	Improve the methodology for distinguishing between international and domestic navigation.	Resolved. During the review, the NEA officer in charge of the national energy statistics confirmed that the data collection is done according to the departure and arrival ports of each journey, which is in line with the 2006 IPCC Guidelines.
E.11	1.A Fuel combustion – sectoral approach – liquid fuels – CO_2 (E.19, 2016) (E.19, 2015) Accuracy	Use either default oxidation factors in accordance with the 2006 IPCC Guidelines or country-specific oxidation factors if there is sufficient information to support their use for estimating CO_2 emissions from fuel combustion, and ensure that the oxidation factors reported in the NIR are consistent with those used in estimating CO_2 emissions.	Resolved. During the review, Iceland revised the CO_2 emissions from fuel combustion for the whole time series using an oxidation factor for liquid fuels equal to 1 and resubmitted the CRF tables (see ID# E.22 in table 5).
E.12	1.A.2 Manufacturing industries and construction – solid fuels – CO_2 (E.11, 2016) (E.11, 2015) (31, 2014) Transparency	Investigate how the EF was derived and include this information in the NIR.	Resolved. Iceland uses the IPCC default CO_2 EF of 25.8 t C/TJ indicated in the 2006 IPCC Guidelines for coking coal and other bituminous coal used in the cement industry.

ID#	*Issue and/or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
E.13	1.A.2 Manufacturing industries and construction – liquid fuels – CO_2, CH_4 and N_2O (E.12, 2016) (E.12, 2015) (34, 2014) Accuracy	Correct the differentiation of fuel consumption between stationary and mobile combustion in the construction sector.	Resolved. Iceland already differentiates the consumption according to the data provided by NEA. In its next annual submission, Iceland will improve the corresponding description in the NIR.
E.14	1.A.3.b Road transportation – liquid fuels – CO_2, CH_4 and N_2O (E.13, 2016) (E.13, 2015) (35, 2014) (32, 2013) Accuracy	Make an effort to apply higher-tier methods to estimate GHG emissions from road transportation, which is a key category.	Resolved. The ERT considers that applying a higher-tier method would only be relevant for estimating CH_4 and N_2O emissions. The ERT noted that CH_4 and N_2O emissions from road transportation are not key categories. Iceland used a tier 1 method to estimate CH_4 and N_2O emissions, which is in accordance with the 2006 IPCC Guidelines. The ERT agreed with the approach used by Iceland.
E.15	1.A.3.b Road transportation – liquid fuels – CO_2, CH_4 and N_2O (E.14, 2016) (E.14, 2015) (36, 2014) Accuracy	Use a consistent methodology for the division of vehicle groups and conduct recalculations for the earlier years of the time series (1990–2005).	Not resolved. During the review, Iceland indicated that this issue will be investigated as part of a forthcoming revision of the energy sector in the GHG inventory.
E.16	1.A.3.e Other transportation – liquid fuels – CO_2, CH_4 and N_2O (E.15, 2016) (E.15, 2015) (32, 2014) Transparency	Report transparent information on emissions from off-road and ground activities occurring in airports that have been accounted elsewhere.	Not resolved. During the review, Iceland indicated that this issue will be investigated and resolved in future submissions.
IPPU			
I.1	2. General (IPPU) – CO_2, HFCs, PFCs, SF_6 and NF_3 (I.3, 2016) Transparency	Report in the CRF tables emission estimates or the relevant notation keys, as appropriate, for the subcategories glass production (2.A.3), ammonia production (2.B.1), adipic acid production (2.B.3), soda ash production (2.B.7) and electronic industry (2.E), and for foam blowing agents (2.F.2), fire protection (2.F.3), solvents (2.F.5) and other applications (2.F.6).	Addressing. Iceland used the notation key "NO" to report information under the subcategories glass production (2.A.3), ammonia production (2.B.1), adipic acid production (2.B.3) and soda ash production (2.B.7). However, the ERT noted that there were blank cells in the CRF tables for subcategories 2.E.1 to 2.E.4 (under electronic industry (2.E)) and for several subcategories and gases under product uses as substitutes for ozone-depleting substances (2.F).
I.2	2.A.2 Lime production – CO_2 (I.4, 2016) (I.3, 2015) Transparency	Report emissions from lime production at the Elkem Iceland ferrosilicon plant separately under lime production (category 2.A.2) in the CRF tables and by updating the relevant sections of	Resolved. During the review, Iceland indicated that there is no production of lime at the Elkem Iceland ferrosilicon plant, but limestone is used there for purposes that are non-emissive (see ID# I.11 in table 5). Relevant information was provided in the NIR (table 4.2, p.62).

ID[a]	*Issue and or problem classification*[b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
		the NIR.	
I.3	2.A.4 Other process uses of carbonates – CO_2 (I.5, 2016) (I.4, 2015) Transparency	Use the notation key "IE" for reporting information on the use of soda ash under the subcategory 2.A.4.b and indicate, in CRF table 9, that emissions are reported under the subcategory other (chemical industry) (2.B.10).	Resolved. Iceland used the notation key "IE" for the period 1990–2004 and the notation key "NO" for after 2004, as the use of soda ash associated with silicon production in Iceland stopped in 2004 (NIR, p.64).
I.4	2.C.2 Ferroalloys production – CH_4 (I.6, 2016) Transparency	Improve the transparency of reporting of emissions from ferroalloys production by resolving the inconsistencies between the NIR and the CRF tables.	Resolved. Iceland resolved the inconsistencies between CRF table 2(I) and table 4.4 of the NIR.
I.5	2.D Non-energy products from fuels and solvent use – CH_4 and N_2O (I.7, 2016) Completeness	Estimate and report the missing emissions from solvent use and resolve the inconsistencies between the NIR and the CRF tables for the category non-energy products from fuels and solvent use (2.D).	Resolved. The ERT noted that Iceland used the notation keys "NA" and "NO" to report on CH_4 and N_2O emissions from non-energy products from fuels and solvents under the subcategory other non-energy products from fuels and solvent use (2.D.3). The ERT further noted that no inconsistencies were found between table 2.11 of the NIR and CRF table 2(I) regarding emissions from non-energy products from fuels and solvent use.
I.6	2.F.1 Refrigeration and air conditioning – HFCs (I.8, 2016) Accuracy	Correct the emission estimates for the subcategories refrigeration and air conditioning (2.F.1), and resolve the inconsistencies between the NIR and the CRF tables.	Resolved. During the review, Iceland revised its emission estimates from refrigeration and air conditioning and submitted revised CRF tables. The ERT did not observe inconsistencies between table 2.12 of the NIR and CRF table 2(I).
I.7	2.F.1 Refrigeration and air conditioning – HFCs and PFCs (I.9, 2016) (I.5, 2015) Transparency	Report the HFC and PFC emissions recovered for the subcategory refrigeration and air conditioning (2.F.1) separately from the emissions themselves.	Resolved. Iceland estimated and reported recovery emissions for F-gases in refrigeration and air conditioning in accordance with the recommendation. The notation key "IE" is no longer used.
I.8	2.F.4 Aerosols – HFCs (I.10, 2016) (I.6, 2015) Accuracy	Estimate HFC emissions from the subcategory metered dose inhalers (under aerosols (2.F.4)) using a methodology consistent with the 2006 IPCC Guidelines, and report the estimates.	Resolved. Iceland estimated and reported emissions from the subcategory metered dose inhalers using the 2006 IPCC Guidelines.
I.9	2.G.1 Electrical equipment – SF_6 (I.11, 2016) (I.7, 2015) Accuracy	Estimate and report emissions from the category electrical equipment (2.G.1) using a methodology in accordance with the 2006 IPCC Guidelines.	Resolved. Iceland estimated and reported emissions from the category electrical equipment using the 2006 IPCC Guidelines.
Agriculture			
A.1	3. General (agriculture) –	Include detailed explanations of the AD, EFs and emission trends	Not resolved. No additional information on AD and EFs has been provided in the NIR since the

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	CO_2, CH_4 and N_2O (A.1, 2016) (A.1, 2015) (56, 2014) Transparency	for all categories, including for young cattle population and for N_2O emissions from synthetic N fertilizer applied to agricultural soils.	previous submission (see ID#s A.8, A.9 and A.10 in table 5).
A.2	3.B Manure management – N_2O (A.3, 2016) (A.3, 2015) (61, 2014) (57, 2013) Transparency	Include in the NIR information on the circumstances under which the country-specific Nex data have been estimated.	Not resolved. Iceland has not included information in the NIR showing how country-specific Nex data have been estimated (see ID# A.21 in table 5).
A.3	3.B.5 Indirect N_2O emissions – N_2O (A.9, 2016) (A.9, 2015) Transparency	Estimate indirect N_2O emissions from manure management (3.B.5), including N_2O emissions from N volatilized as ammonia and NOx and from N lost through leaching and run-off, and report the relevant background data, or, if the Party considers these emissions as insignificant, provide in the NIR sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Addressing. Iceland has reported indirect N_2O emissions from manure management (3.B.5) in CRF table 3.B(b). However, no corresponding documentation is provided in the NIR and there is a lack of consistency between N values reported in CRF table 3.B(b) and table 3.D (see ID#s A.18 and A.19 in table 5).
A.4	3.D.a.2 Organic N fertilizers – N_2O (A.10, 2016) (A.10, 2015) Completeness	Collect information on sewage sludge and other organic fertilizers applied to soils and estimate the related emissions, or, if the Party considers these emissions to be insignificant, provide in the NIR sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. Iceland reports in the NIR (p.119) that sewage sludge has been used since 2012 on agricultural soils and that approximately 200 t stabilized sludge was applied in 2015. However, Iceland still uses the notation key "NE" to report N_2O emissions from sewage sludge applied to soils (3.D.a.2.b) in CRF table 3.D, without indicating in either the NIR or CRF table 9 why such emissions have not been estimated. The ERT believes that future ERTs should consider this issue further to ensure that emissions under this subcategory are not underestimated.
A.5	3.D.a.5 Mineralization/immobilization associated with loss/gain of soil organic matter – N_2O (A.11, 2016) (A.11, 2015) Completeness	Improve the completeness of the inventory by estimating N_2O emissions from mineral soils, or, if the Party considers these emissions as insignificant, provide in the NIR sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. During the review, Iceland explained that it assumes no CSC in agricultural mineral soils. However, the ERT noted in the NIR (p.165) and in CRF table 4.B that Iceland reported CSC in soils of 0.26 kt C under grassland converted to cropland in 2015, which may indicate a loss of soil N and related N_2O emissions that could be estimated using equation 11.8 from the 2006 IPCC Guidelines.
A.6	3.D.a.6 Cultivation of organic soils (i.e. histosols) – N_2O	Include in the NIR a comparison of the country-specific N_2O EF for the cultivation of histosols	Not resolved. The country-specific EF used by Iceland (0.96 kg N_2O-N/ha/year) is lower than the default EF in the 2006 IPCC Guidelines and in the

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	(A.4, 2016) (A.4, 2015) (63, 2014) (59, 2013) Transparency	with peer-reviewed studies.	Wetlands Supplement as well as being outside the uncertainty range of 2–24 kg N_2O-N/ha of the 2006 IPCC Guidelines. Moreover, the EF is only published in a report that is not peer reviewed and is not available in English. During the review, Iceland presented information on how the country-specific EF was derived. The low EF was explained by special soil conditions in Iceland related to, inter alia, volcanic activities that create aeolian deposition of volcanic materials, which may inhibit the formation of N_2O during the degradation of organic matter and the associated release of reduced N and its further denitrification and nitrification (see ID# L.21 in table 5). The ERT considers that the information and supporting documentation provided during the review is relevant. However, Iceland did not include in the NIR all the relevant information explaining its country-specific EF, including a comparison of its country-specific EF with international published studies.
A.7	3.F Field burning of agricultural residues – CH_4 and N_2O (A.5, 2016) (A.5, 2015) (54, 2014) Transparency	Include in the NIR additional information on the non-occurrence of field burning of agricultural crop residues activity.	Not resolved. During the review, Iceland informed the ERT that field burning does not occur in Iceland. However, the ERT noted that this information is not included in the NIR. The ERT also noted that Iceland used the notation key "NO" to report on field burning of agricultural residues in CRF table 3.F. However, in table 5.2 of the NIR, Iceland uses the notation key "NE".
LULUCF			
L.1	4. General (LULUCF) (L.2, 2016) (L.2, 2015) (67, 2014) Transparency	Enhance the transparency of the information in the NIR on the uncertainty analysis.	Not resolved. The Party did not report information on the uncertainty analysis in accordance with the 2006 IPCC Guidelines. The ERT noted that information on methods, underlying assumptions, data sources and documentation of expert judgments used to calculate uncertainties was not reported. During the review, Iceland stated that the LULUCF chapter of the NIR includes information on uncertainties and that improvements will be addressed in future submissions. In order to address the recommendation, the ERT suggests that Iceland enhance the transparency of the information on the uncertainty analysis, for instance by reporting in a tabular format, for each GHG estimate, the uncertainty of the AD, EFs and other parameters, as well as the source of such information and the uncertainty of the GHG estimate, including the procedure applied to calculate it and the equations used.
L.2	Land representation (L.3, 2016) (L.3, 2015) (68, 2014) Transparency	Select the required information and organize it in a manner that enables the reader to clearly understand the data sources and their quality and the methodology	Not resolved. The ERT noted that the discussion of land representation in the NIR was not reorganized in accordance with the previous recommendation. During the review, Iceland sought clarification on how information on land representation could be

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
		used to derive the land representation.	streamlined to enable the reader to better understand data sources and methodology used to derive data on representation. The ERT considers that Iceland could enhance the transparency of the information provided on land representation by reporting, in a tabular format, the following information for each land category: (1) the data sources; (2) the time series of raw data; (3) the methodology applied for filling in gaps in the raw data, if any; (4) the methodology applied, including assumptions and inferences, to derive the land category areas from the raw data; (5) the methodology applied for filling in gaps in the time series of areas, if any; (6) the transition time of the land category (for land in conversion categories); and (7) any other relevant information.
L.3	4.A Forest land – CO_2 (L.4, 2016) (L.4, 2015) (69, 2014) Transparency	Provide an additional description of the processes by which CSC and associated emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type.	Not resolved. Additional description of and related information on the estimation processes were not provided in the NIR. During the review, Iceland provided a description that clarified the estimation process. The ERT considers that Iceland could improve the transparency of the NIR by, for example, including summary tables of average carbon stocks with relevant data on forest areas and intermediate outputs stratified by year and forest type, as described by Iceland during the review.
L.4	4.A.1 Forest land remaining forest land – CO_2 (L.9, 2016) (L.9, 2015) Comparability	Estimate and report CSC in mineral soils under forest land remaining forest land.	Not resolved. Iceland continues to report CSC in mineral soils as "NE". During the review, Iceland indicated that, according to the tier 1 method in the 2006 IPCC Guidelines, the carbon stocks for mineral soils are assumed to be in equilibrium when there is no change in land use. The ERT considers that the use of a tier 1 method is in accordance with the 2006 IPCC Guidelines because there is no change in land use and therefore no CSC. The ERT further considers that the use of the notation key "NA" for reporting CSC in mineral soils when using a tier 1 method would be more appropriate.
L.5	4.B.1 Cropland remaining cropland – CO_2 (L.10, 2016) (L.10, 2015) Completeness	Estimate and report CSC in mineral soils under cropland remaining cropland.	Not resolved. Iceland continues to report CSC in mineral soils as "NE". During the review, Iceland indicated that CSC in soil organic matter (mineral soils) under cropland remaining cropland is not estimated on the basis that no changes in management practices have occurred in the past 20 years. The ERT noted that CO_2 emissions from cropland remaining cropland is a key category. The ERT considers that Iceland should make every effort to use the recommended method (tier 2 or tier 3), in accordance with the corresponding decision trees in the 2006 IPCC Guidelines, or explain in the NIR why Iceland is unable to implement a recommended method.

ID[a]	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.6	4.B.2 Land converted to cropland – N_2O (L.5, 2016) (L.5, 2015) (73, 2014) Comparability	Report N_2O emissions from disturbances associated with land-use conversion to cropland.	Resolved. Iceland reports "IE" for N_2O emissions associated with land-use conversion to cropland. During the review, Iceland stated that emissions have been included under the agriculture sector in accordance with the footnote to CRF table 4(III) indicating that no disaggregated data are available.
L.7	4.B.2 Land converted to cropland (L.11, 2016) (L.11, 2015) Accuracy	Estimate the area of forest land and other land that was converted to cropland before 1990 and report these values under the appropriate categories.	Not resolved. During the review, Iceland indicated that there are no systematic records of previous land use on land converted to cropland. This activity will be addressed through the planned improvements. Furthermore, Iceland provided a presentation on how land-use maps are used to derive land use and land-use change of areas, including on the use of grid sampling plots for some land-use categories.
L.8	4.B.2.2 Grassland converted to cropland – CO_2 (L.6, 2016) (L.6, 2015) (71, 2014) Accuracy	Ensure the equivalence of climatic, historical and edaphic conditions when analysing pairs of samples (i.e. in cropland and grassland) to determine the dynamic of the soil carbon stocks associated with conversion among the two land uses.	Not resolved. The ERT noted that Iceland reports net CO_2 emissions from the conversion of grassland to cropland. During the review, Iceland stated that it will include in the list of planned improvements an exploration of the underlying data to ensure the equivalence of the pairs of samples used for estimating CSC between cropland and grassland.
L.9	4.C Grassland – CO_2 (L.7, 2016) (L.7, 2015) (72, 2014) (67, 2013) Completeness	Prepare estimates for the emissions from degraded areas of grassland.	Not resolved. During the review, Iceland indicated that it is preparing to estimate emissions from degraded areas of grassland.
L.10	4.C.1 Grassland remaining grassland – CO_2 (L.12, 2016) (L.12, 2015) Completeness	Estimate and report CSC in mineral soils under grassland remaining grassland for "Natural birch shrubland – old" and "Revegetated land older than 60 years".	Not resolved. During the review, Iceland indicated that currently there are no financial or human resources to perform the analysis of the collected soil samples to allow estimation of CSC in mineral soils for grassland remaining grassland. Iceland further stated that, according to the tier 1 method in the 2006 IPCC Guidelines, the carbon stocks of mineral soils are assumed to be in equilibrium when there is no change in land use and, therefore, it will use the notation key "NA" in future annual submissions. The ERT noted that CO_2 emissions from grassland remaining grassland is a key category. The ERT considers that Iceland should make every effort to use the recommended method (tier 2 or tier 3), in accordance with the corresponding decision trees in the 2006 IPCC Guidelines, or explain in the NIR why Iceland is unable to implement a recommended method.
L.11	4.D.2.3 Land converted to wetlands – CO_2 (L.13, 2016) (L.13, 2015) Completeness	Estimate and report CSC in mineral soils under land converted to wetlands.	Not resolved. Iceland used the notation key "NE" to report CSC in mineral soils under land converted to other wetlands. During the review, Iceland indicated that estimating CSC under this subcategory will be included in the improvement plan.
L.12	4.E.2 Land converted	Estimate and report CSC in	Not resolved. Iceland used the notation key "NE"

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	to settlements – CO_2 (L.14, 2016) (L.14, 2015) Completeness	mineral soils under land converted to settlements.	to report CSC in mineral soils under land converted to settlements. During the review, Iceland indicated that this will be included in the improvement plan.
L.13	4 (III) Direct N_2O emissions from N mineralization/immobilization – N_2O (L.15, 2016) (L.15, 2015) Completeness	Estimate direct N_2O emissions from N mineralization associated with the loss of soil carbon resulting from land converted to settlements for the entire time series of the GHG inventory or, if the Party considers these emissions as insignificant, provide in the NIR sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. Iceland did not estimate direct N_2O emissions from N mineralization associated with the loss of soil carbon resulting from land converted to settlements for the entire time series of the GHG inventory. During the review, Iceland acknowledged that this needs to be addressed and indicated that it will be included in the improvement plan.
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.1, 2016) (W.1, 2015) (78, 2014) Transparency	Include information in the NIR on the AD used.	Not resolved. The ERT noted that the amount of waste deposited in solid waste disposal sites, categorized by type of waste, for the entire time series, is not presented in the NIR. During the review, Iceland indicated that the information will be included in its next annual submission.
W.2	5.A Solid waste disposal on land – CH_4 (W.2, 2016) (W.2, 2015) (79, 2014) (72, 2013) Transparency	Include in the NIR more information on landfill gas utilization (e.g. energy content of recovered gas, place of utilization).	Resolved. Relevant information is provided in the NIR (figure 7.5). During the review, Iceland explained that the data on landfill gas recovery is delivered to EA in terms of CH_4 quantities, which are the relevant data. Iceland further clarified that the amount of gas recovered is from a single location.
W.3	5.A Solid waste disposal on land – CH_4 (W.7, 2016) (W.7, 2015) Transparency	Present in the NIR information on how the methane generation rate and half-life for construction and demolition waste were chosen.	Not resolved. The ERT noted that there was no explanation of how the methane generation rate and half-life for construction and demolition waste were chosen or any information on the source of the expert judgment (e.g. name, organization, year, assumptions). During the review, Iceland informed the ERT that it will include additional information in the NIR of its next annual submission.
W.4	5.A Solid waste disposal on land – CH_4 (W.8, 2016) Adherence to UNFCCC Annex I inventory reporting guidelines	Correct the reference to the section of the NIR in which CH_4 recovery from solid waste disposal on land is discussed.	Resolved. The reference to the section of the NIR in which CH_4 recovery from solid waste disposal on land is discussed (i.e. section 7.2.4.1) was corrected (NIR, p.203).
W.5	5.A Solid waste disposal on land – CO_2 and CH_4 (W.9, 2016) (W.8, 2015)	Report CO_2 emissions from the subcategories anaerobic managed waste disposal sites (5.A.1.a), unmanaged waste disposal sites (5.A.2) and uncategorized waste disposal sites (5.A.3) or, if the	Addressing. During the review, Iceland confirmed that CO_2 emissions are not occurring in the indicated subcategories as no disposed waste has been combusted on the disposal sites as a management practice. Iceland replaced the notation key "NE" with the notation key "NO" and submitted revised

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
	Transparency	Party considers these emissions as insignificant, provide in the NIR sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines.	CRF tables. However, the ERT noted that Iceland still uses the incorrect notation key in the NIR for reporting CO_2 emissions from managed waste disposal sites (5.A.1) and unmanaged waste disposal sites (5.A.2) (NIR, table 7.2, p.197).
W.6	5.A.1.a Anaerobic – CH_4 (W.10, 2016) (W.9, 2015) Adherence to UNFCCC Annex I inventory reporting guidelines	Correct the inconsistency between the NIR and CRF table 5.A with regard to the amounts of CH_4 flared.	Resolved. The ERT noted that the reported data on incinerated (flared) CH_4 in the NIR (figure 7.5, p.206) and in CRF table 5.A are consistent.
W.7	5.B.1 Composting – N_2O and CH_4 (W.11, 2016) (W.10, 2015) Transparency	Include information on the amount of waste composted for the whole time series in the NIR.	Resolved. The ERT noted that the amount of waste composted is reported in the NIR (figure 7.3) and in CRF table 5.B for the whole time series.
W.8	5.D Wastewater treatment and discharge – CH_4 and N_2O (W.5, 2016) (W.5, 2015) (81, 2014) (74, 2013) Completeness	Include in the NIR more background data on sludge removal (e.g. amount and N content), clearly indicating in which category the resulting emissions are accounted for.	Not resolved. Iceland reported in the NIR that approximately 200 t stabilized sewage sludge were applied to soils in Iceland in 2015, which is a significant increase compared with previous estimates of about 25 t for the period 2012–2014, and that the resulting emissions will be included in the next annual submission. During the review, Iceland informed the ERT that the availability of data is limited and that it will address the recommendation in future submissions. Iceland further informed the ERT that the issue is not likely to be resolved in its next annual submission.
W.9	5.D Wastewater treatment and discharge – CH_4 and N_2O (W.6, 2016) (W.6, 2015) (82, 2014) (75, 2013) Transparency	Investigate the issue of the protein intake further and report on any new results for N_2O emissions from human sewage based on the yearly per capita protein intake.	Not resolved. The ERT noted that the protein supply data for Iceland published by FAO in its statistical database (FAOSTAT) continued to be significantly higher than the values reported by Iceland. The ERT is of the view that Iceland could investigate the applicability of data available from international sources, such as FAO, in order to obtain new results for N_2O emissions from human sewage and compare those with the current estimates.
W.10	5.D Wastewater treatment and discharge – N_2O (W.12, 2016) (W.11, 2015) Transparency	Provide in the NIR the information used to estimate emissions from wastewater treatment and discharge, that is, population of the country, protein consumption and total organic matter in the wastewater, for the entire time series, and ensure this information is consistent between the NIR and the CRF tables.	Not resolved. The ERT noted that no action has been taken to include in the NIR information on the population of the country, protein consumption and total organic matter in the wastewater, for the entire time series, and to ensure that this information is consistent between the NIR and the CRF tables. During the review, Iceland indicated that the information will be included in the NIR of its next GHG inventory submission.

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
W.11	5.D.2 Industrial wastewater – CH_4 (W.13, 2016) (W.12, 2015) Transparency	Correct the use of notation keys in the NIR to report CH_4 emissions from industrial wastewater.	Not resolved. The ERT noted that the information in section 7.6.2.2 of the NIR (p.218) on the reporting of CH_4 emissions from industrial wastewater (reported as "NE") has not been corrected to "IE". However, in table 7.2 of the NIR (p.197) Iceland uses the correct notation key "IE" for reporting CH_4 and N_2O emissions from industrial wastewater, including an indication of where in the inventory these emissions are reported. The ERT noted that the information on where the emissions are reported also needs to be provided in CRF table 9.
KP-LULUCF			
KL.1	General (KP-LULUCF) (KL.3, 2016) (KL.3, 2015) Transparency	Provide information on how harvesting or forest disturbance that is followed by the re-establishment of a forest is distinguished from deforestation.	Not resolved. Relevant information was not provided in the NIR. During the review, Iceland presented information explaining that all forest land subject to deforestation through harvesting and/or clear-cutting is based on licences and is recorded annually using georeferenced data provided by IFR. The ERT considers that such a system allows harvesting and/or forest disturbance followed by re-establishment to be distinguished from deforestation. Iceland informed the ERT that information on how harvesting or forest disturbance that is followed by the re-establishment of a forest is distinguished from deforestation will be included in the NIR of its next annual submission.
KL.2	General (KP-LULUCF) – CO_2, CH_4 and N_2O (KL.4, 2016) (KL.4, 2015) Transparency	Include in the NIR country-specific information on the associated FM and AR and background levels of emissions associated with annual disturbances, and information on a margin and how to avoid the expectation of net credits or net debits during the commitment period, including through the use of a margin.	Not resolved. Country-specific information on the establishment of the background level plus margin associated with natural disturbances for FM and AR was not provided in the NIR. During the review, Iceland explained the rationale behind the background levels of emissions associated with annual disturbances and the margin (see ID# KL.8 in table 5).
KL.3	General (KP-LULUCF) – CO_2, CH_4 and N_2O (KL.5, 2016) (KL.5, 2015) Transparency	Report information clearly demonstrating that emissions by sources and removals by sinks resulting from FM under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, are not accounted for under activities under Article 3, paragraph 3.	Not resolved. Relevant information was not reported in the NIR. During the review, Iceland stated that distinguishing between FM and AR in cultivated forest is done on the basis of the age of the plantation on afforested land. Afforestation since 1990 is classified as AR. Iceland further stated that other plantations are classified as FM because they were planted before 1990. All areas of natural birch forest mapped in the 1987–1991 forest inventory are defined as FM. Forest expansion of natural birch forest since 1990 is defined as AR. Iceland further stated that this information will be included in the NIR of its next annual submission.

ID[a]	*Issue and/or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
KL.4	Afforestation and reforestation – CO_2, CH_4 and N_2O (KL.1, 2016) (KL.1, 2015) (86, 2014) Transparency	Provide an additional description of the process by which CSC and associated emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type.	Not resolved. Relevant information was not provided in the NIR. During the review, Iceland clarified that the observed inter-annual variation in CSC can be explained as changes in growth/increment measured in inventories annually and these changes are not related to changes in land area or harvesting. The ERT considers that the explanation provided by Iceland is adequate and should be included in the NIR of its next annual submission.
KL.5	Deforestation – CO_2, CH_4 and N_2O (KL.2, 2016) (KL.2, 2015) (87, 2014) Accuracy	Recalculate CSC in soil organic matter by ensuring symmetry among the pairs of land-use conversions (e.g. grassland converted to forest land, and forest land converted to grassland).	Not resolved. CSC in soil organic matter has not been recalculated. During the review, Iceland stated that clarifying information will be included in the next NIR. The ERT noted that Iceland still does not ensure symmetry among the pairs of land-use conversions.
KL.6	Forest management – CO_2 (KL.6, 2016) (KL.6, 2015) Accuracy	Provide the technical correction to the FMRL in the next GHG inventory submission.	Not resolved. During the review, Iceland explained that a technical correction to the FMRL, including a new emission estimate for HWP, in accordance with decision 2/CMP.7, annex, paragraph 16, will be conducted. The ERT considers that Iceland has an FMRL based on a projection that includes emissions from HWP estimated on the basis of instantaneous oxidation. However, according to decision 2/CMP.7, annex, paragraph 16, the treatment of HWP in the construction of a projected FMRL is to be in accordance with the provisions outlined in paragraph 29 of the annex to the same decision and not on the basis of instantaneous oxidation.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 annual submission of Iceland, and have not been addressed by the Party.

Table 4
Issues identified in three successive reviews and not addressed by Iceland

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[a]*
General		
G.2	Ensure that one organization has a full understanding of the complete energy balance and can compile a transparent and complete energy balance	4 (2013–2017)

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
G.4	Report in the annual submission any changes in the national system in accordance with decision 15/CMP.1, annex, chapter I.F, and/or further relevant decisions of the CMP	3 (2014–2017)
Energy		
E.2	Report information on electrode consumption, steam coal consumption and petroleum coke consumption that provides justification for significant inter-annual changes and gaps in the time series of fuel consumption and associated emissions	3 (2014–2017)
E.3	Provide transparent information in cases where GHG emissions have been accounted for elsewhere and the notation key "IE" is used to report such emissions	3 (2014–2017)
E.4	Provide more transparent information on the modification methodologies used when recategorizing the data received from NEA	4 (2013–2017)
E.15	Use a consistent methodology for the division of vehicle groups and conduct recalculations for the earlier years of the time series (1990–2005)	3 (2014–2017)
E.16	Report transparent information on emissions from off-road and ground activities occurring in airports that have been accounted elsewhere	3 (2014–2017)
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
A.1	Include detailed explanations of the AD, EFs and emission trends for all categories, including for young cattle population and for N_2O emissions from synthetic N fertilizer applied to agricultural soils	3 (2014–2017)
A.2	Include in the NIR information on the circumstances under which the country-specific Nex data have been estimated	4 (2013–2017)
A.6	Include in the NIR a comparison of the country-specific N_2O EF for the cultivation of histosols with peer-reviewed studies	4 (2013–2017)
A.7	Include in the NIR additional information on the non-occurrence of field burning of agricultural crop residues activity	3 (2014–2017)
LULUCF		
L.1	Enhance the transparency of the information in the NIR on the uncertainty analysis	3 (2014–2017)
L.2	Select the required information and organize it in a manner that enables the reader to clearly understand the data sources and their quality and the methodology used to derive the land representation	3 (2014–2017)
L.3	Provide an additional description of the processes by which CSC and associated emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type	3 (2014–2017)
L.8	Ensure the equivalence of climatic, historical and edaphic	3 (2014–2017)

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
	conditions when analysing pairs of samples (i.e. in cropland and grassland) to determine the dynamic of the soil carbon stocks associated with conversion among the two land uses	
L.9	Prepare estimates for the emissions from degraded areas of grassland	4 (2013–2017)
Waste		
W.1	Include information in the NIR on the AD used	3 (2014–2017)
W.8	Include in the NIR more background data on sludge removal (e.g. amount and N content), clearly indicating in which category the resulting emissions are accounted for	4 (2013–2017)
W.9	Investigate the issue of the protein intake further and report on any new results for N_2O emissions from human sewage based on the yearly per capita protein intake	4 (2013–2017)
KP-LULUCF		
KL.4	Provide an additional description of the process by which CSC and associated emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type	3 (2014–2017)
KL.5	Recalculate CSC in soil organic matter by ensuring symmetry among the pairs of land-use conversions (e.g. grassland converted to forest land, and forest land converted to grassland)	3 (2014–2017)

[a] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not "successive" reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 is considered as one year.

V. Additional findings made during the 2017 individual inventory review

9. Table 5 contains findings made by the ERT during the individual review of the 2017 annual submission of Iceland that are additional to those identified in table 3.

Table 5
Additional findings made during the 2017 individual review of the annual submission of Iceland

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[b] If yes, classify by type*
General			
G.5	National system	In accordance with the national system guidelines (decision 19/CMP.1, as revised by decisions 3/CMP.11 and 4/CMP.11), Iceland must establish and maintain the institutional, legal and procedural arrangements necessary to perform the functions of the national system and define and allocate specific responsibilities in the inventory development process. Iceland must specify the roles of, and cooperation between, government agencies and other entities involved in the preparation of the inventory, as well as the institutional, legal and procedural arrangements made to prepare the inventory. The ERT noted that in the NIR (p.248) it is stated that the data collection for the 2017 submission was based on formal agreements established under Act 65/2007, which was superseded by Act 70/2012. Iceland also stated in the NIR that a new regulation on data collection and information from institutions related to Iceland's inventory of GHG emissions and removals is under preparation and that a draft is already in place. During the review, Iceland informed the ERT that the new regulation (520/2017) was adopted at the beginning of June 2017 and that it will facilitate the data collection process and preparation of the inventory. The regulation ensures that EA continues to have overall responsibility for the preparation, planning and management of the national inventory with the support and participation of other governmental organizations. However, the ERT noted that despite the formal agreements and the new regulation being in place, the institutional, legal and procedural arrangements between different government agencies, including the roles and responsibilities, were not yet fully understood by all the involved institutions. Therefore, the ERT concluded that Iceland is not sufficiently implementing decision 19/CMP.1, annex, paragraphs 10(a) and 12(c) on the national system. The ERT recommends that Iceland report comprehensive information in the NIR on the status of implementation of regulation 520/2017, including how Iceland ensures that the institutional, legal and procedural arrangements between different government agencies, including the roles and responsibilities, are fully understood by all the involved institutions (e.g. Agricultural University of Iceland, IFR and the Ministry of Environment and Natural Resources) and the changes in the national system resulting from such implementation (if any).	Yes. Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
G.6	National system	In the implementation of the national system Iceland must ensure sufficient capacity for timely performance of the functions defined in the national system guidelines, including data collection for estimating anthropogenic GHG emissions by sources and removals by sinks and arrangements for technical competence of the staff involved in the inventory development process. In section 1.3 of the NIR (p.7), Iceland briefly presented information on the process of inventory preparation and, in chapter 3 of the NIR, information on changes in the national system. During the review, Iceland explained that the 2016 and 2017 GHG annual submissions were prepared by a new inventory team. The ERT noted that despite the efforts and the national system in place, the inventory review team was not able to fully explain all the choices and assumptions made in past submissions. The ERT also noted that the size of the inventory team (three members) and the attributed responsibilities of the team, which include preparation of the air pollutants emissions inventory and managing stationary installations	Yes. Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[b] If yes, classify by type
		under the framework of the European Union Emissions Trading System in addition to the preparation of the GHG inventory submission, may be highly demanding. Therefore, the ERT concluded that Iceland is not sufficiently implementing decision 19/CMP.1, annex, paragraph 10(b). The ERT recommends that Iceland include in the NIR complete information on efforts made by the Party to continue supporting the enhancement of the technical competence of the new inventory team and report on any change in its capacity to ensure that the national system performs its functions. These efforts could include, for example, ensuring a sufficient number of competent national experts for each inventory sector and facilitating the participation of relevant institutions in the inventory process, as well as promoting continuous improvement via training and practical experience.	
G.7	QA/QC and verification	According to the UNFCCC Annex I inventory reporting guidelines, paragraph 19, each Annex I Party shall elaborate an inventory QA/QC plan and implement general inventory QC procedures in accordance with its QA/QC plan following the 2006 IPCC Guidelines. In addition, decision 19/CMP.1, annex, paragraph 12(d), also requires Parties to elaborate an inventory QA/QC plan. Iceland stated in the NIR (pp.10 and 11) that a QA/QC plan and manual have been prepared. A brief explanation of the QA/QC applied is included in some sectoral chapters of the NIR. During the review, Iceland presented additional information on the tools and spreadsheets used for QA/QC and informed the ERT that such tools and spreadsheets are being improved. It also explained that it intends to revise the QA/QC plan and manual once the improvements to the tools and spreadsheets are finalized. The ERT considers that the QA/QC plan and manual have not been fully applied in all sectors and that the related information presented in the NIR chapters is not transparent, given that it does not explain the tools and spreadsheets that have been applied in the QA/QC process. The ERT recommends that Iceland report in the NIR complete information on the tools and spreadsheets used for QA/QC and present a summary of the revised QA/QC plan and manual once they are finalized.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
G.8	Uncertainty analysis	According to decision 24/CP.19, annex I, paragraph 15, Annex I Parties shall quantitatively estimate the uncertainty of the data used for all source and sink categories using at least approach 1 from the 2006 IPCC Guidelines, and report uncertainties for at least the base year and the latest inventory year and the trend uncertainty between these two years. Iceland stated in the NIR that uncertainties were estimated for all inventory sectors, including LULUCF, according to the IPCC good practice guidance. It also stated that it is in the process of reviewing its uncertainty analysis and, in February 2017, new templates were created for uncertainty estimates based on the approach in table 3.2, volume 1, of the 2006 IPCC Guidelines. The new templates were not used in the 2017 annual submission, but their implementation is in progress and they will be used for the next annual submission. The ERT confirmed the implementation of the new templates during the review and considers that the use of the IPCC good practice guidance for uncertainty calculation is not in line with the UNFCCC Annex I inventory reporting guidelines, even if the results of the uncertainty analysis do not differ substantially from those calculated using the 2006 IPCC Guidelines. The ERT commends Iceland for its efforts to improve the uncertainty analysis by using the 2006 IPCC Guidelines	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or problem? If so, classify by type
		and recommends that Iceland present the results obtained through the use of the 2006 IPCC Guidelines in the next annual submission.	
Energy			
E.17	1. General (energy sector)	Chapter 3 of the NIR reports the values adopted by Iceland for the uncertainty associated with AD and EFs for all the categories in the energy sector. However, it does not explain the rationale for having adopted these values. During the review, Iceland informed the ERT that the rationale for these choices was unclear as documentation regarding this matter was not available and the personnel at EA have changed since the uncertainty analysis was carried out. However, during the review, the ERT had the opportunity to address this issue with an expert from NEA, who provided relevant information and showed good knowledge of the types of uncertainty associated with the consumption data of the fuels used under the different categories of the national inventory that could be used to reassess the uncertainty associated with the AD and EFs in the energy sector. The ERT recommends that Iceland reassess the uncertainty values for AD and EFs used to carried out the uncertainty evaluation and archive the relevant supporting information in accordance with decision 19/CMP.1, and implement the provision from its regulation 520/2017 on the joint work of EA and NEA regarding the uncertainty analysis.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
E.18	1. General (energy sector)	The ERT noted that section 3.1.4 of the NIR indicates that no sector-specific QA/QC procedures for the energy sector have been developed. In addition, this section of the NIR indicates that general QC accuracy checks on data acquisition and calculation procedures are carried out. However, the ERT identified several errors and omissions in the national inventory; for example: (1) the selected values for oxidation factors were omitted for certain subcategories; (2) the inclusion of gasoline in table 3.9 of the NIR on stationary combustion, when this fuel is not used under this category; (3) the use of incorrect values of CH_4 and N_2O EFs for diesel oil under road transportation; (4) the inconsistent selection of NCV and carbon content for steam coal; (5) missing CO_2 and fugitive CH_4 emissions from one of the seven geothermal power plants; (6) unidentified CO_2 capture activities in geothermal plants; and (7) the unidentified use of charcoal. The ERT recommends that Iceland correct the several errors and omissions in the national inventory, such as the omission of oxidation factors in the emission estimates, incorrect allocation of fuels, incorrect use of EFs for diesel oil used in the transportation sector, inconsistent use of NCV and carbon content for steam coal, missing emissions and emission capture from geothermal power plants, and missing use of charcoal. The ERT also encourages Iceland to develop and implement category-specific QC procedures for key categories and for those categories in which significant methodological changes and/or revisions have occurred in the energy sector.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
E.19	1. General (energy sector)	The ERT noted that sections 3.4.1.4 and 3.4.2.4 of the NIR specify five planned improvements for the energy sector, which are to: (1) use the IPCC default EFs reported in the 2006 IPCC Guidelines for those cases where the Revised 1996 IPCC Guidelines were still used; (2) implement a higher-tier approach to estimate the emissions from	Not an issue/problem

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		road transportation; (3) estimate emissions from biofuels used in transport; (4) synchronize the energy balance approach between the CRF tables and Eurostat for fuel combustion under fishing; and (5) estimate emissions from aviation using the tier 2 approach. The ERT also noted a number of recurring issues in previous recommendations (see ID#s E.2, E.3, E.4, E.15 and E.16 in table 3), which Iceland has not thus far resolved and which have not been included in the list of planned improvements. During the review, Iceland informed the ERT that it has neither identified a prioritization of issues nor set a timeline for the implementation of improvements across the inventory categories, and that these tasks will be undertaken in direct cooperation with external consultants after the review. The ERT encourages Iceland to develop a prioritized improvements plan for the energy sector, taking into consideration the follow-up of previous recommendations and the results of the key category analysis and the uncertainty analysis.	
E.20	Fuel combustion – reference approach – solid fuels – CO_2	The energy chapter of the NIR does not indicate any fuel combustion of anthracite, while section 4.4 of the NIR (IPPU sector) indicates the use of anthracite as a reducing agent. However, the ERT noted that for anthracite, CRF table 1.A(b) (reference approach) reports the amount of carbon stored (excluded) as "NO", which implies that all anthracite has been combusted. During the review, Iceland acknowledged that this was an error in the reference approach reporting and indicated that the carbon excluded should be 100 per cent because all emissions from anthracite use are attributed to industrial processes (as a reductant). The ERT recommends that Iceland report the correct amount of carbon excluded from anthracite use in CRF table 1.A(d) for the calculation of CO_2 emissions from fuel combustion activities under the reference approach.	Yes. Comparability
E.21	1.A. Fuel combustion – sectoral approach – all fuels – CO_2	Iceland uses the tier 1 approach to estimate the GHG emissions from all fuel combustion activities. The ERT noted that the following CO_2 emissions have been identified as key categories under the tier 1 level assessment excluding LULUCF: (1) road transportation (accounting for 14.5 per cent of total emissions in 2015); (2) agriculture, forestry and fishing (12.3 per cent of total emissions in 2015); and (3) manufacturing industries and construction (1.5 per cent of total emissions in 2015). The ERT further noted that all fuel used in Iceland is imported. During the review, NEA informed the ERT that imported fuels are being tested on a regular basis to verify their compliance with current legislation on fuel quality. The ERT also noted that if country-specific NCV and CO_2 EFs can be derived for motor gasoline, diesel oil and fuel oil, this would allow more than 25 per cent of total emissions to be estimated using the tier 2 approach. More specifically, the ERT is of the view that Iceland may wish to contact the fuel testing laboratory (Fjölver laboratory and fuel inspection; see http://new.fjolver.is/english/) to: (1) obtain information on the fuels that are being tested and the properties that are determined (most likely NCV and sulfur content); (2) obtain the measured fuel properties, if relevant; (3) statistically analyse the obtained information and undertake a comparative assessment with reference to the IPCC default parameters and possibly with the country-specific parameters of the fuels used in those countries from which Iceland imports the fuels (e.g. Norway); and (4) assess, on the basis of this analysis, the possibility of deriving country-specific fuel parameters.	Yes. Accuracy

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem[m] If yes, classify by type*
		The ERT recommends that Iceland develop country-specific fuel properties (NCVs and carbon content of fuels) that would allow it to use the tier 2 approach for key categories in line with the 2006 IPCC Guidelines.	
E.22	1.A. Fuel combustion – sectoral approach – liquid fuels and solid fuels – CO_2	The NIR indicates that oxidation factor values provided in the Revised 1996 IPCC Guidelines (0.99 for liquid fuels and 0.98 for solid fuels) were used. The NIR also indicates that, for most fuels, Iceland has adopted the IPCC default CO_2 EFs provided in the 2006 IPCC Guidelines. The ERT noted that CO_2 EFs from the 2006 IPCC Guidelines are consistent with an oxidation factor value of 1, not with those provided in the Revised 1996 IPCC Guidelines. In addition, the ERT identified that for certain subcategories a value of 1 was used for liquid fuels. During the review, Iceland informed the ERT that oxidation factor values of 0.99 and 0.98 were used in the calculations and in certain cases these values were omitted in error. The ERT noted that by using oxidation factor values of less than 1 and not providing any information to support the adoption of these values, Iceland was potentially underestimating the CO_2 emissions from fuel combustion activities of liquid and solid fuels. During the review, Iceland revised the CO_2 emissions from combustion activities using an oxidation factor value of 1 and resubmitted the CRF tables for the period 1990–2015. The ERT agreed with the revised estimates. The ERT recommends that Iceland update the oxidation factor values reported in the NIR in accordance with the oxidation factor values used to estimate CO_2 emissions from fuel combustion activities of liquid and solid fuels.	Yes. Transparency
E.23	1.A.2 Manufacturing industries and construction – solid fuels and other fossil fuels – CO_2	The ERT noted that section 3.3.1.2 of the NIR reports values selected by Iceland for the NCV of steam coal (27.59 TJ/kt) and NCV and carbon content of wastes of electrodes (31.35 TJ/kt and 31.42 t C/TJ, respectively) used in the cement industry that have not been defined in the 2006 IPCC Guidelines. The NIR does not indicate how these values have been derived. The NIR also indicates that the carbon content for steam coal is that defined in the 2006 IPCC Guidelines for both coking coal and other bituminous coal (25.8 t C/TJ). The ERT also noted that the NCV and the carbon content of a fuel are both physical properties mainly dependent on the carbon contained in the fuel, and the selection of the values for these properties from different sources may be inherently inconsistent. During the review, Iceland informed the ERT that these values were reported by the cement factory, which closed in 2011, and it is no longer possible to trace the source of these properties. The ERT recommends that Iceland provide justification for the country-specific values or, if that is not possible, use the tier 1 IPCC default values of NCV and carbon content defined in the 2006 IPCC Guidelines for steam coal and wastes of electrodes. The ERT also recommends that Iceland archive all relevant information regarding the selection of AD, EFs and associated parameters (e.g. NCV) used to estimate the emissions.	Yes. Accuracy
E.24	1.A.2 Manufacturing industries and construction – liquid fuels – CH_4	The NIR indicates the use of CH_4 and N_2O EFs from tables 2.7 and 2.8 of the 2006 IPCC Guidelines to estimate the emissions under manufacturing industries and construction for the complete time series. The ERT is of the view that the CH_4 and N_2O EFs are provided as examples but they do not constitute IPCC default EFs and mostly reflect technologies and practices used in 2005 in the United States of America. During the review, Iceland did not provide the rationale for adopting these EFs; Iceland informed the ERT that this choice has not been documented and this	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[b]? If yes, classify by type
	and N_2O	particular issue will be addressed in future annual submissions. The ERT recommends that Iceland assess the use of the CH_4 and N_2O EFs that are reported as examples in the 2006 IPCC Guidelines, and use tier 1 IPCC default values if it is not possible to explain how the non-default CH_4 and N_2O EFs defined in the 2006 IPCC Guidelines represent average conditions in Iceland.	
E.25	1.A.3.b Road transportation – diesel oil – CH_4 and N_2O	The ERT noted that section 3.4.2.2 of the NIR indicates that CH_4 and N_2O EFs for diesel oil have been taken from the Revised 1996 IPCC Guidelines. The ERT also noted that the CH_4 and N_2O EFs for gasoline reported in table 3.16 of the NIR are those from the Revised 1996 IPCC Guidelines. However, for diesel oil the ERT could not find the correspondence between the reported EFs in table 3.16 of the NIR and those in the Revised 1996 IPCC Guidelines. During the review, Iceland informed the ERT that some errors were detected in the calculations, which will be corrected for future annual submissions. The ERT assessed the CH_4 and N_2O IEFs resulting from the combustion of diesel oil under road transportation reported by Iceland in CRF table 1.A(a) against (1) the tier 1 IPCC default values in the 2006 IPCC Guidelines (3.9 kg CH_4/TJ and 3.9 kg N_2O/TJ) and (2) the IEFs reported by selected Northern European countries (Denmark, Finland, Norway, Sweden) and the United Kingdom of Great Britain and Northern Ireland. The ERT further noted that the IEFs reported by Iceland were in general one order of magnitude lower than the corresponding values of the five selected countries. More specifically, for the year 2015 the following differences were found in IEFs (all expressed in kg/TJ): (1) cars, 0.20 versus 1.82–3.17 (N_2O) and 0.08 versus 0.13–1.33 (CH_4); (2) light-duty trucks, 0.20 versus 1.39–2.17 (N_2O) and 0.06 versus 0.17–0.24 (CH_4); and (3) heavy-duty trucks, 0.10 versus 2.18–3.96 (N_2O) and 0.20 versus 0.17–1.31 (CH_4). The ERT noted that the values of CH_4 and N_2O EFs used by Iceland in its calculations have led to a potential underestimation of CH_4 and N_2O emissions from diesel oil combustion under road transportation. During the review, Iceland revised its CH_4 and N_2O emissions from diesel oil used in road transportation using the tier 1 IPCC default values reported in the 2006 IPCC Guidelines. The ERT agreed with the revised estimates and Iceland submitted revised CRF tables. The ERT recommends that Iceland update the NIR with the CH_4 and N_2O EFs used for estimating emissions from diesel oil in road transportation. The ERT further encourages the Party to develop and implement category-specific QC checks.	Yes. Transparency
E.26	1.A.3.b Road transportation – other fuels – CO_2, CH_4 and N_2O	The ERT noted that NEA reported on its website (http://www.nea.is/fuel/alternative-fuels/methane/) that CH_4 has been collected from a waste yard since 2000 and utilized as fuel for transport since 2003, and that it is estimated that the production capacity of the CH_4 collecting yard is enough to provide about 4,000 cars with fuel, but only a fraction of that number is using CH_4 thus far. During the review, Iceland indicated that there is no information in its archives indicating the reason for not having considered this activity. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions from this activity. The ERT recommends that Iceland undertake an evaluation of the use of CH_4 collected from waste yards in road transportation and consider estimating and reporting the emissions associated with the use of CH_4 in road	Yes. Completeness

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem*[20] *If yes, classify by type*
		transportation, avoiding potential double counting with the waste sector.	
E.27	1.A.4 Other sectors – other fuels – CO_2, CH_4 and N_2O	The ERT noted that emissions from the use of charcoal have not been included in the national inventory. However, during the review, the ERT noted the use of charcoal for grilling in the country. During the review, Iceland acknowledged that this biofuel is being used and that, although NEA does not report consumption figures, it would be possible to obtain the consumption data. Iceland further stated that it could not obtain these consumption data during the review. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions from this activity. The ERT recommends that Iceland collect AD on the consumption of charcoal, estimate its emissions, report the corresponding CO_2 emissions as a memo item and include the non-CO_2 emissions in the corresponding CRF table and national totals.	Yes. Completeness
E.28	1.B.2.d Other (oil, natural gas and other emissions from energy production) – other fuels – CO_2 and CH_4	The ERT noted that section 3.7.2.3 of the NIR briefly summarizes the plant-specific method used by Iceland to estimate CO_2 and CH_4 emissions from geothermal power plants. During the review, the ERT asked Iceland to provide a reference with more detailed information on the determination of GHG emissions from geothermal electricity production. In response, Iceland stated that: (1) the emissions measured at all seven geothermal power plants are available on the NEA website (http://www.nea.is/the-national-energy-authority/energy-data/data-repository/) under the title "Gas emissions of geothermal power plants and utilities 1969–2016" and the data set includes CO_2, CH_4 and H_2S emissions from combined heat and power plants, electric power plants, one power plant that is under construction and one heat plant; and (2) the methodology used for estimating the emissions from geothermal power plants is described in the Orkustofnun report (2011). The report indicates that emission estimates are based on measurements of the flow rate of steam through the plants and chemical analyses of the steam. Furthermore, the ERT was informed that: (1) all CO_2, CH_4 and H_2S contained in the steam gas is assumed to go into the gas phase upon separation of steam and liquid by the wellhead and that the gases are released into the atmosphere; (2) two power companies (HS Orka and Landsvirkjun) collect samples at the wellhead and at the separator station, whereas another (Orkuveita Reykjavíkur) gathers samples in the power plant; and (3) the estimated emissions of the power plant under construction prior to generation of electricity (Þeistareykir) are based on gas released from the individual holes that are allowed to blow steam into the atmosphere prior to the steam being harnessed into the turbines. The ERT also noted that there is a wealth of information available through NEA that would allow the Party to improve the transparency of the reporting of the methodology used to estimate CO_2 and CH_4 emissions from geothermal power plants. The ERT recommends that Iceland improve the description provided in the NIR of the methodology used to estimate the emissions from geothermal power plants, as this is a key category accounting for 11.1 per cent of the GHG emissions of the energy sector, by providing the necessary details in order to facilitate the replication and assessment of the inventory.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[20] If yes, classify by type*
E.29	1.B.2.d Other (oil, natural gas and other emissions from energy production) – other fuels – CO_2 and CH_4	The ERT noted that CO_2 and CH_4 emissions from geothermal electricity generation have been estimated and reported by Iceland. The ERT also noted that geothermal energy is used for other purposes in Iceland, namely space heating, snow melting, fish farming, swimming pools, industry and greenhouses (NEA, 2010). These applications account for a large share of geothermal energy use in Iceland. For instance, NEA (2010) indicates that, in 2008, electricity production from geothermal energy amounted to 4,038 GWh while the direct use of geothermal energy for the other applications amounted to 7,000 GWh. During the review, Iceland indicated that geothermal power plants invariably use fluids from 'high temperature' areas. These geothermal fluids are over 200 °C in the ground and are released as steam when they reach the surface. Geothermal facilities that produce only heat are invariably 'low-temperature' district heating plants, where the geothermal fluid is less than 150 °C in the ground and much less steam is released. The NEA experts are of the view that GHG emissions are practically negligible, and they have not been estimated. The ERT notes that the 2006 IPCC Guidelines do not provide a methodology to estimate emissions from geothermal energy. The ERT recommends that Iceland include in the NIR additional information regarding the use of geothermal fluids and associated emissions, making it explicit that all geothermal power plants are covered and that other uses of geothermal power are not considered.	Yes. Transparency
E.30	1.B.2.d Other (oil, natural gas and other emissions from energy production) – other fuels – CO_2 and CH_4	The ERT noted that NEA (2015) indicates that in 2015 there were seven geothermal power plants in the country. During the review, Iceland's inventory team found that the emissions from one of the seven power plants had not been included in the totals of this subcategory. Iceland compiled the CO_2 and CH_4 emissions, included them in the total emissions from this subcategory and submitted revised CRF tables for the whole time series. The ERT agreed with the revised estimates.	Not an issue/problem
E.31	1.B.2.d Other (oil, natural gas and other emissions from energy production) – other fuels – CO_2 and CH_4	The time series of the CO_2 IEF for geothermal energy production exhibits a decreasing trend from 1993 to 2015, while that of the CH_4 IEF shows a rather constant pattern between 1997 and 2009 with larger variability in the earlier and most recent years. In response to a question raised by the ERT regarding the underlying reasons for the observed trends in these two IEFs, Iceland indicated that a rigorous examination of these emissions has not been undertaken thus far, but that possible explanations include variations in use (boreholes vary greatly in emissions) and the activities of the CarbFix project (https://www.or.is/english/carbfix-project), which injects CO_2 emissions in lava fields. During the review, NEA provided the ERT with data from Reykjavik Energy on the amounts of CO_2 that have been injected since the CarbFix project started: 0.175 kt (2012), 2.381 kt (2014), 3.911 kt (2015) and 6.644 kt (2016). The ERT examined these data and concluded that the amounts of CO_2 injected do not explain the decrease in CO_2 IEFs as the impacts of these amounts of CO_2 removed are negligible compared with the emitted amounts. The ERT notes that the CO_2 emissions are below the threshold for commencement of an adjustment procedure in accordance with decision 22/CMP.1, annex, paragraph 80(b), and therefore this issue was not included	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		in the list of potential problems and further questions raised by the ERT. The ERT recommends that Iceland identify the main drivers for the trend in CO_2 and CH_4 emissions (e.g. power plants, geothermal fields) and investigate why geothermal electricity is being produced with decreasing levels of CO_2 emissions per GWh since 1993, and report its findings in the NIR.	
IPPU			
I.10	2. General (IPPU) – CO_2, N_2O, HFCs, PFCs and SF_6	The ERT noted that on page 61 of the NIR Iceland refers to using the IPCC good practice guidance as one of the methodological approaches in estimating GHG emissions in the IPPU sector. During the review, Iceland explained that no estimations were made using the IPCC good practice guidance and that this statement in the NIR was an error. The ERT encourages Iceland to remove any reference to the IPCC good practice guidance from the NIR as no emissions under the IPPU sector are estimated using this guidance.	Not an issue/problem
I.11	2.A.4 Other process uses of carbonates – CO_2	Table 4.2 of the NIR reports only one current use of carbonates in the mineral industry, namely use of soda ash in mineral wool production. During the review, Iceland explained that there was no information available on any other uses of carbonates in the country, and acknowledged that no recent surveys have been done to confirm this assertion. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions under this subcategory. The ERT recommends that Iceland determine whether there are other uses of carbonates in the country that might not be reflected in the current official records, including the use of carbonates in, for example, the construction industry, ceramics, agriculture and environmental pollution control, and estimate the corresponding emissions if they occur.	Yes. Completeness
I.12	2.C.2 Ferroalloys production – CH_4	The ERT noted that CRF table 2(I).A-H reports that the IEF for CH_4 emissions in ferrosilicon production is 0.00045 t CH_4/t product in 2015 in the original submission. The ERT also noted that this value is significantly lower than the IPCC default value of 1.0 kg CH_4/t product. During the review, Iceland reported that an incorrect approach was used to estimate CH_4 emissions in ferrosilicon production, wherein estimates were based on combustion instead of process emissions. During the review, Iceland revised these emissions using the IPCC default CH_4 EF and submitted revised CRF tables for the whole time series. The ERT agreed with the revised estimates.	Not an issue/problem
I.13	2.F Product uses as substitutes for ozone depleting substances – HFCs, PFCs and	The ERT noted that in CRF table 2(II).B-H there were blank cells for emissions from fire protection and aerosols (except metered dose inhalers) for the entire time series. During the review, Iceland explained that under the current regulation on F-gases (regulation 834/2010), which transposes European Commission regulation 842/2006, it is forbidden to place on the market F-gases and products containing them, with a few exceptions, such as propellants in pharmaceuticals. Iceland further explained that there have been no recent surveys on import and use of F-gases in	Yes. Completeness

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem? If yes, classify by type
	SF_6	the country. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions. The ERT recommends that Iceland regularly conduct F-gas and product use surveys in order to estimate F-gas emissions for all relevant subcategories on the basis of the latest possible information, with a frequency of at most three years, and include in the NIR information on the level of enforcement of the prohibition of F-gas fire extinguishers and other aerosol products, including personal care products (e.g. haircare products, deodorant, shaving cream), household products (e.g. air fresheners, oven and fabric cleaners), industrial products (e.g. special cleaning sprays such as those for operating electrical equipment, lubricants, pipe freezers).	
I.14	2.F.1 Refrigeration and air conditioning – HFCs and PFCs	The ERT noted that the product manufacturing IEF for HFC-23 for commercial refrigeration reported in CRF table 2(II).B-H is 2,198.41 per cent and the disposal loss factor is 120 per cent. During the review, Iceland was not able to identify the reasons for such extreme values and indicated that it would follow up on this. The ERT recommends that Iceland revise its estimates of HFC-23 emissions from manufacturing of commercial refrigeration.	Yes. Accuracy
I.15	2.G.1 Electrical equipment – SF_6	Iceland used the notation key "NA" to report recovery of SF_6 emissions from electrical equipment in CRF table 2(II).B-H. During the review, Iceland explained that the disposal of electrical equipment is subject to F-gas emission control regulations and the gas extracted from such equipment is sent out of the country for destruction. Iceland indicated that more information will be pursued from relevant bodies. The ERT noted that the non-recovery of F-gases in disposed electrical equipment could lead to the overestimation of emissions. The ERT recommends that Iceland obtain clear information about the recovery of SF_6 emissions from electrical equipment and revise its emission estimates as necessary.	Yes. Accuracy
Agriculture			
A.8	3. General (agriculture)	The ERT noted that animal numbers/production level reported in the NIR differ from those reported by Statistics Iceland. The animal numbers from Statistics Iceland are based on the annual December census. To allow for the estimation of animal numbers/production level the NIR (p.100) presents different weighting factors for different animal types. During the review, Iceland explained how data from Statistics Iceland are used together with the weighting factors as well as animal weights to estimate the animal numbers. The ERT agreed with the explanation and considered that, except for a calculation error in the number of horses (see ID# A.16 below), the estimates of animal numbers/production level are correct. The ERT recommends that Iceland include in the NIR additional tables with the animal numbers from Statistics Iceland (or other data sources) combined with the background estimations of animal numbers reported in the CRF tables for the agriculture sector for the whole time series and, in cases where the 2006 IPCC Guidelines prescribe the use of average animal populations, include additional information on how it has converted the animal numbers	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[b] If yes, classify by type
		from Statistics Iceland to average animal populations.	
A.9	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the latest update of agricultural productivity data in Iceland's inventory was made in 2012 with the collection of data from relevant bodies, such as the Agricultural University of Iceland, slaughterhouses and farmers. The ERT considered that, as agricultural productivity changes with time, some of these factors may be outdated. The ERT recommends that Iceland update its productivity data, in particular the weight categories for cattle, poultry productivity (live weight and living age) and swine productivity (piglets per sow), and include in its improvement plan to update the productivity data at regular intervals.	Yes. Accuracy
A.10	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the information on the average gross energy intake, typical animal mass and VS reported by Iceland in CRF tables 3.A, 3.B(a) and 3.B(b) does not allow emission estimates for CH_4 and N_2O to be reconstructed. During the review, Iceland explained that the AD reported in the CRF tables on average gross energy intake, typical animal mass, VS daily excretion and Nex rate were simple averages and not weighted averages, as used in the calculations. The ERT considered that the calculations were correctly made. The ERT recommends that Iceland report weighted average AD for feed intake, typical animal mass, VS excretion rates and Nex rates in the CRF tables and in the NIR, as used in the calculations.	Yes. Transparency
A.11	3.A.1 Cattle – CH_4	The ERT noted that Iceland applied an MCF of 6.0 per cent from the IPCC good practice guidance to estimate CH_4 emissions from enteric fermentation from cattle. Although this value is within the range of variation of the default factor of the 2006 IPCC Guidelines (6.5 ± 1.0 per cent), Iceland was not able to explain the use of such a value. During the review, Iceland revised its CH_4 emissions from enteric fermentation from cattle using the default factor from the 2006 IPCC Guidelines and submitted revised CRF tables. The ERT agreed with the revised estimates. The ERT recommends that Iceland update the CH_4 EF reported in the NIR to the CH_4 EF used to estimate CH_4 emissions from enteric fermentation from cattle.	Yes. Transparency
A.12	3.A.1 Cattle – CH_4 and N_2O	The ERT noted that Iceland reported information on growing cattle under the subcategory other mature cattle in the CRF tables and in the NIR. According to the 2006 IPCC Guidelines, cattle populations should be classified into at least three categories: mature dairy, other mature, and growing cattle (section 10.2.2 of volume 4). The reported emission estimates were made in accordance with the 2006 IPCC Guidelines. The ERT recommends that Iceland report information on and emissions from growing cattle under the subcategory growing cattle instead of the subcategory other mature cattle.	Yes. Comparability
A.13	3.A.2 Sheep –	The ERT noted that Iceland applied an MCF ranging from 5.0 to 7.0 per cent from the IPCC good practice guidance. During the review, Iceland was not able to provide information that would support the use of such values.	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[b] If yes, classify by type
	CH_4	Therefore, Iceland revised its CH_4 emissions from enteric fermentation from sheep using the default MCFs of 4.5 per cent and 6.5 per cent from the 2006 IPCC Guidelines, using a different MCF for sheep younger and older than one year, and submitted revised CRF tables. The ERT agreed with the revised estimates. The ERT recommends that Iceland update the CH_4 EF reported in the NIR to the CH_4 EF used to estimate CH_4 emissions from enteric fermentation from sheep.	
A.14	3.A.3 Swine – CH_4	The ERT noted that Iceland used a tier 1 method for estimating CH_4 emissions from enteric fermentation from swine. During the review, Iceland clarified that the MCF (average 1.53 kg CH_4/head/year) used for estimating CH_4 emissions from enteric fermentation from swine was based on the Revised 1996 IPCC Guidelines. The ERT noted that the MCF in the 2006 IPCC Guidelines is 1.5 kg CH_4/head/year. The ERT recommends that Iceland include in the NIR information to support the use of an MCF based on the Revised 1996 IPCC Guidelines or apply the default factor from the 2006 IPCC Guidelines for estimating CH_4 emissions from enteric fermentation from swine.	Yes. Accuracy
A.15	3.A.4 Other livestock – CH_4	The ERT noted that Iceland used a tier 1 method for estimating CH_4 emissions from enteric fermentation from horses and poultry. During the review, Iceland clarified that the MCF used for estimating CH_4 emissions from horses and poultry was based on the Revised 1996 IPCC Guidelines. The ERT recommends that Iceland include in the NIR information to support the use of an MCF based on the Revised 1996 IPCC Guidelines or apply the default factors from the 2006 IPCC Guidelines for estimating CH_4 emissions from enteric fermentation from horses and poultry.	Yes. Accuracy
A.16	3.A.4 Other livestock – CH_4 and N_2O	The ERT noted that the number of horses in the years 2013–2015 has been incorrectly estimated. During the review, Iceland acknowledged that the correct number that should have been used to estimate CH_4 and N_2O emissions was 75,000 horses; however, the value of 73,610 horses was used. The ERT recommends that Iceland correct the CH_4 and N_2O emission estimates from other livestock based on the correct number of horses for the years 2013–2015 and avoid any underestimation of emissions for this subcategory.	Yes. Accuracy
A.17	3.B Manure management – N_2O	The ERT noted that Iceland reported incorrect values for the average Nex rates in CRF table 3.B(b) for non-dairy cattle. The ERT further noted that these incorrect values were not used in the estimates. During the review, Iceland explained that the average Nex rates used in the calculations were those for Western European conditions in table 10.19 of the 2006 IPCC Guidelines, except for mature dairy cattle, where national Nex rates for mature dairy cattle were used. The ERT recommends that Iceland correct the average Nex rates reported in CRF table 3.B(b) so that they reflect the actual Nex rates used for estimating N_2O emissions from manure management.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[29] If yes, classify by type*
A.18	3.B Manure management – N_2O	The ERT noted that Iceland, for its 2017 annual submission, updated the methodology for estimating emissions from N sources to an N mass flow based on the *EMEP/EEA air pollutant emission inventory guidebook 2016* combined with Nex rates from the 2006 IPCC Guidelines. During the review, Iceland clarified that the aim was to improve and coordinate emission estimates between UNECE under CLRTAP and the Convention. The development of such an N mass flow system is undertaken by an external consultant. The ERT welcomed this approach. However, the ERT was not able to fully understand the correlation between the volatilization of N-containing compounds reported under UNECE and under the Convention. The ERT recommends that Iceland provide additional information in the NIR to allow for a better understanding of the N mass flow approach, in particular the correlation between the volatilization of N-containing compounds reported under UNECE and under the Convention.	Yes. Transparency
A.19	3.B Manure management – N_2O	The ERT noted that Iceland used total ammoniacal N in manure for estimating N volatilization in its updated N mass flow approach based on the *EMEP/EEA air pollutant emission inventory guidebook 2016*. The ERT noted that total ammoniacal N is only part of the total N and varies among animal types. During the review, Iceland recognized that for all animal types the N_2O emission estimates were based on the amount of total ammoniacal N and not on the total amount of N excreted as required by the 2006 IPCC Guidelines. The ERT considers that this has led to an underestimation of the reported N_2O emissions. The ERT further considers that the underestimation is below the threshold for commencement of an adjustment procedure in accordance with decision 22/CMP.1, annex, paragraph 80(b), and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. The ERT recommends that Iceland correct its N_2O emission estimates by using the total amount of N excreted in the different manure management systems.	Yes. Accuracy
A.20	3.B Manure management – N_2O	The ERT noted that Iceland used default N_2O EFs for manure management systems from the Revised 1996 IPCC Guidelines and the IPCC good guidance practice. The ERT also noted that these factors have been updated in the 2006 IPCC Guidelines. During the review, Iceland indicated that this was an error and that it will update the EFs in its next annual submission. The ERT noted that some of the currently used EFs are lower than those in the 2006 IPCC Guidelines and some are higher. The ERT considered that the overall outcome from a recalculation would be below the threshold for commencement of an adjustment procedure in accordance with decision 22/CMP.1, annex, paragraph 80(b), and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. The ERT recommends that Iceland correct its N_2O emission estimates from manure management systems by using the default N_2O EFs from the 2006 IPCC Guidelines or provide additional information that supports the use of other N_2O EFs that may be more representative of manure management systems in Iceland.	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem? If yes, classify by type
A.21	3.B.1 Cattle – N_2O	The ERT noted that the country-specific Nex rate for mature dairy cattle ranges from 72.00 kg/head/year in 1990 to 94.79 kg/head/year in 2000. After the year 2000 the Nex rate is constant and equal to 94.79 kg/head/year. The ERT further noted an increase in the milk yield: 11.35 litres/day (1990), 12.76 litres/day (2000) and 16.03 litres/day (2015). The ERT considered that an increase in milk production between 2000 and 2015 would inevitably lead to an increase in the Nex rate for the same period. During the review, Iceland indicated that it would investigate this issue further and update the Nex rate in its next annual submission. The ERT further considered that N_2O emissions from manure management are underestimated but that the underestimation is below the threshold for commencement of an adjustment procedure in accordance with decision 22/CMP.1, annex, paragraph 80(b), and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. Finally, the ERT noted that since 2012 Iceland has included a revision of the Nex rate for cattle and sheep in its improvement plans in the corresponding NIRs; however, no improvements have been made so far. The ERT recommends that Iceland update the Nex rate for mature dairy cattle, in particular for 2000 onwards, in accordance with the best available knowledge and current production rates.	Yes. Accuracy
A.22	3.D.a.2.a Animal manure applied to soils – N_2O	The ERT noted that the incorrect estimates of the number of horses (see ID# A.16 above) and the Nex rate for mature dairy cattle (see ID# A.21 above), and the errors in the mass flow methodology for estimating emissions from N sources (see ID# A.19 above), combined with the lack of documentation on N losses from manure management systems, do not allow a reconstruction of the estimates reported in CRF table 3.D on the amount of N in animal manure applied to soils. The ERT considered that the impact on the N_2O emissions is below the threshold for commencement of an adjustment procedure in accordance with decision 22/CMP.1, annex, paragraph 80(b). The ERT believes that future ERTs should confirm that there is not an underestimation of emissions. The ERT recommends that Iceland correct the estimates of animal manure applied to soils and the corresponding emissions for the subcategory 3.D.a.2.a reported in CRF table 3.D, taking into account any updates to the population of horses and the Nex rates for mature dairy cattle, as well as updates to the total amount of N excreted in different manure management systems.	Yes. Accuracy
A.23	3.D.a.6 Cultivation of organic soils (i.e. histosols) – N_2O	The ERT noted that Iceland estimated the N_2O emissions from cultivation of organic soils in cropland based on the area of organic soils reported in CRF table 4.B. The ERT also noted that N_2O emissions from organic soils in grassland are estimated based on the area reported in CRF table 4.C and reported in the LULUCF sector in CRF table 4(II), under the subcategory other (4.II.H), rather than reported in the agriculture sector under the subcategory cultivation of organic soils (3.D.a.6) in CRF table 3.D. The ERT further noted that Iceland reported 0.0849 kt N_2O in CRF table 3.D for 2015, occurring only in cropland. The total reported N_2O emissions in 2015 in CRF table 4(II) are estimated to be 0.25 kt N_2O (from 367.45 kha drained organic soils). During the review, Iceland explained that these soils are not cultivated/managed and therefore these emissions should not be reported in CRF table 3.D. Also, during the review, a presentation by Iceland on how the Party estimates its land-use classes for the LULUCF sector made it clear to the ERT that drainage and therefore management are taking place	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[20] If yes, classify by type
		on land that is considered grassland. These organic soils are used for feeding 472,000 mature sheep and their lambs, which means that animal manure is dropped in these areas. According to an article provided to the ERT (Arnalds et al., 2016), Iceland has 9,000 km^2 inland wetlands with soils exhibiting both andosol and histosol properties. According to Arnalds et al. (2016), 4,195 km^2 (419,500 ha), or 47 per cent of all Icelandic inland wetlands, have been affected by drainage. The reported total area of organic soils in the Icelandic GHG inventory is 423,762 ha, of which 367,450 ha are reported under grassland, and the related N_2O emissions from these soils are reported in CRF table 4(II). Arnalds et al. (2016) therefore clearly indicates that these soils are under management. According to footnote 2 to CRF table 3.D and footnote 1 to CRF table 4(II), N_2O emissions from drained organic soils should be reported under cultivation of organic soils (3.D.a.6) in CRF table 3.D. During the review, the ERT requested Iceland to provide additional information demonstrating that those areas are not managed and not drained in order to justify reporting them in CRF table 4(II), under the subcategory other (4.II.H); however, no answer was provided by Iceland. The ERT believes that future ERTs should consider this issue further to ensure that there is not an underestimation of emissions. The ERT recommends that Iceland correct the misallocation of N_2O emissions by moving the N_2O emissions under the subcategory other (4.II.H) in CRF table 4(II) to the subcategory cultivation of organic soils (3.D.a.6) in CRF table 3.D.	
A.24	3.D.b.1 Atmospheric deposition – N_2O	The ERT noted that N_2O emissions from volatilized N under the subcategory atmospheric deposition (3.D.b.1) in CRF table 3.D are closely related to the total N volatilization reported from Iceland to UNECE under CLRTAP (http://ceip.at/ms/ceip_home1/ceip_home/status_reporting/2017_submissions/). The ERT also noted that in CRF table 3.D, only N_2O emissions from N volatilized from agricultural fields are to be reported, that is mineral fertilizers, animal manure applied to soils, urine and dung dropped by animals, and other N amendments. Given that Iceland reports N volatilization under the subcategory indirect N_2O emissions (3.B(b).5) in CRF table 3.B(b), it is possible that emissions are being reported twice. The ERT recommends that Iceland make a thorough examination of its N flow to estimate emissions from N volatilized from atmospheric deposition reported in CRF table 3.D and consider including in the NIR a table with the overall mass balance of N, including information on N volatilized as NOx, nitric oxide and N_2O.	Yes. Accuracy
LULUCF			
L.14	4. General (LULUCF) – CO_2, CH_4 and N_2O	The ERT noted that Iceland did not provide an uncertainty assessment for some carbon pools, such as DOM and soil for certain land-use categories. In accordance with decision 24/CP.19, annex I, paragraph 15, Iceland is to quantitatively estimate the uncertainty of the data used for all source and sink categories using at least approach 1 in the 2006 IPCC Guidelines, and report uncertainties for at least the base year and the latest inventory year and the trend uncertainty between these two years. During the review, Iceland indicated that work on improving uncertainty estimation is ongoing as part of the improvement plan and will be included in future annual	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
		submissions. The ERT recommends that Iceland conduct an uncertainty assessment of all carbon pools and gases in the LULUCF sector in accordance with decision 24/CP.19, annex I, paragraph 15.	
L.15	4. General (LULUCF) – CO_2, CH_4 and N_2O	The ERT noted that Iceland used the notation key "NE" incorrectly, for example when using a tier 1 method where it could be assumed there were no changes in carbon stocks. During the review, Iceland indicated that these cases constituted an error in the application of the notation key and this will be corrected in the next annual submission by using the notation key "NA". The ERT recommends that Iceland review and, as appropriate, revise the use of notation keys under the LULUCF sector for categories estimated using a tier 1 method, in line with decision 24/CP.19, annex I, paragraph 37, and provide additional information to justify why the notation keys used are appropriate.	Yes. Comparability
L.16	Land representation – CO_2, CH_4 and N_2O	The ERT noted that the land transition matrix reported by Iceland was prepared based on data for the years 1990 and 2008–2013. The ERT also noted that there are inconsistencies in land areas reported in CRF table 4.1 for several years across the time series. During the review, Iceland indicated that section 12.2.2 of the NIR describes the preparation of CRF table NIR-2 and that section 6.3.6 of the NIR describes the preparation of CRF table 4.1. Iceland further explained that CRF table 4.1 shows the total area of land remaining in a category and land being converted to a category according to CRF tables 4.A to 4.F and that the area includes the total area of each transfer still in the conversion stage, as defined by the relevant conversion period. The ERT considered that information provided by Iceland in sections 6.3.6 and 12.2.2 of the NIR is not adequate to explain the inconsistencies observed in the land areas in the CRF tables across the time series. The ERT recommends that Iceland improve the land representation data used to report LULUCF emissions and removals under the Convention by reconciling all data on areas contained in databases and land-use maps, as well as data collected from observations, including an estimation of uncertainties related to AD once land matrices are improved and updated. The ERT further recommends that Iceland continue to update land use cover maps and revise the land representation time series and, if appropriate, create land-use subcategories that could better reflect the actual land cover and use, to ensure adequate and consistent data over time, including specifying which IPCC approach is used for land representation by providing explanations in the NIR.	Yes. Transparency
L.17	4.A Forest land – CO_2	The ERT noted that Iceland used the notation key "NE" in several instances in the inventory for reporting on some carbon pools, such as litter and deadwood, in CRF table 4.A for 1990–2015. During the review, Iceland indicated that for the natural birch forest the reason DOM is not estimated is that Iceland estimates net changes in biomass between two points in time. For the cultivated forest, however, DOM is measured and estimated. The ERT recommends that Iceland improve the estimates of CSC under forest land, particularly by including estimates for the deadwood and litter carbon pools, or provide an explanation in the NIR and in CRF table 9 of why these pools could not be estimated.	Yes. Completeness

ID[1]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem[2]? If yes, classify by type
L.18	4.A.2 Land converted to forest land – CO_2	The ERT noted that in CRF table 4.A carbon losses for wetlands, other land and some grasslands converted to forest land are reported using the notation key "IE". The ERT also noted that when land is converted to forest land the initial amount of living biomass is likely not to be removed from the land as instant oxidation (see equations 2.15 and 2.16 in the 2006 IPCC Guidelines). During the review, Iceland informed the ERT that the amount of carbon in annual living biomass was not removed from the land as Iceland assumes that this biomass will remain in the forest after the land-use conversion and thus is included in the national forest inventory. The ERT considered that living biomass in the land which is converted should be assumed as a loss of carbon. The ERT noted that default values for grassland are given in table 6.4 of the 2006 IPCC Guidelines. In the NIR (p.164), it is stated that the above-ground biomass, including litter and standing dead biomass, below 200 m above sea level is 1.27 kg C/m^2 for grassland and 1.80 kg C/m^2 for wetlands. These values are equivalent to 12.7 t C/ha and 18.0 t C/ha, respectively. The default peak carbon stock for grassland ranges between 1.7 and 2.4 t dry matter/ha (see table 6.4 in volume 4 the 2006 IPCC Guidelines), which is equivalent to approximately 0.85–1.2 t C/ha. The ERT noted that the carbon stocks measured by Iceland are more than 10 times higher than the IPCC default values. The ERT further noted that these measured values (12.7 t C/ha and 18.0 t C/ha) are used for land-use conversion to cropland (section 6.5.6, p.166, of the NIR); however, the default carbon stock for cropland is 5 t C/ha (table 5.9 in volume 4 of the 2006 IPCC Guidelines). It is unclear to the ERT how much of the measured biomass in grassland in land converted to forest land will disappear after conversion and how it is included in the national forest inventory. The data source mentioned in the NIR of the measured data is Gudmundsson et al. (2010). This paper does not include any information on the amount of biomass in Icelandic grassland. The ERT recommends that Iceland include transparent information in the NIR on the carbon stock in the Icelandic land-use categories. The ERT also recommends that Iceland implement the calculation methods in line with equations 2.15 and 2.16 of volume 4 of the 2006 IPCC Guidelines with instant oxidation of all amounts of living biomass and litter when making land-use conversions, unless Iceland can document that the carbon stock before land-use conversion is maintained in the land converted.	Yes. Accuracy
L.19	4.C.2 Land converted to grassland – CO_2	The ERT noted that throughout the NIR Iceland uses a carbon sequestration rate in soil of 0.51 t C/ha/year for land converted to forest land and for other land converted to grassland (for example, in p.157 of the NIR). The ERT also noted that this value may be correct for land converted to forest land where there is a plant canopy that can absorb CO_2 from the atmosphere; however, most land conversions to grassland are from disturbed land where no or little plant canopy for carbon sequestration is available. The ERT considers that using a carbon sequestration rate in soil of 0.51 t C/ha/year for other land converted to grassland, which according to the inventory accounts for 275,460 ha in 2015, may not be appropriate. The carbon sequestration in soil in other land converted to grassland areas was investigated in 2000 (Arnalds et al., 2000; Aradottir et al., 2000) and the results show that the measured carbon stock in living biomass values are different from those used in the GHG inventory for land-use conversion for grassland. During the review, Iceland informed the ERT that it has made new measurements on other land	Yes. Accuracy

ID	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem? If yes, classify by type
		converted to grassland, which will be published within a year. The ERT recommends that Iceland revise its CO_2 estimates form land converted to grassland using updated measured data on carbon sequestration in soils, especially for other land converted to grassland, and include in the NIR, in a tabular format, the total estimates of CSC in living biomass, litter and soil, and the average CSC per area for the whole time series, in land converted to grassland and land converted to forest land.	
L.20	4.D.2.3 Land converted to wetlands – CO_2	The ERT noted that Iceland reported a value of –1.97 kt C for CSC in mineral soils in CRF table 4.D. However, in section 6.7.3.2 of the NIR (p.185), Iceland reports that in the CRF tables CO_2 emissions from reservoirs under the subcategories flooded land remaining flooded land (mires converted to reservoirs), grassland converted to flooded land (medium SOC to reservoirs) and other land converted to flooded land (low SOC to reservoirs) are reported as aggregate numbers under CSC of organic and mineral soils. During the review, Iceland indicated that the value –1.97 kt C reported as loss from mineral soils of land converted to wetlands consists of two subcategories: 4.D.2.2.3, grassland converted to flooded land (–1.72 kt C); and 4.D.2.2.5, other land converted to flooded land (–0.25 kt C). Iceland further explained that CSC in mineral and organic soils are reported separately in the CRF tables and that the statement in the NIR referring to reporting of aggregate CSC for mineral and organic soils is incorrect and will be revised in the next annual submission. The ERT recommends that Iceland correct the statement in section 6.7.3.2 of the NIR referring to the reporting of aggregate CSC for mineral and organic soils so as to clarify that the value reported in CRF table 4.D as loss from mineral soils from land converted to wetlands consists of two subcategories (grassland converted to flooded land and other land converted to flooded land) and that CSC in mineral and organic soils are reported separately in the CRF tables.	Yes. Transparency
L.21	4 (II) Emissions and removals from drainage and rewetting and other management of organic/mineral soils – N_2O	The ERT noted that Iceland stated in the NIR (p.157) that it uses a tier 1 method to estimate N_2O emissions from management of organic forest soils. The default N_2O-N EF for drained forest land ranges from 0.22 kg N_2O-N/ha/year for nutrient-poor drained boreal forest land to 3.2 kg N_2O-N/ha/year for nutrient-rich drained boreal forest land. However, the IEF reported by Iceland is 3.46 kg N_2O-N/ha/year, which is higher than the upper limit of the range of default values. During the review, Iceland stated that, owing to specific Icelandic soil conditions, country-specific N_2O EFs are lower than the IPCC default values (see ID# A.6 in table 3). The ERT recommends that Iceland correct its N_2O emission estimates by using the default N_2O EFs from the Wetlands Supplement or provide additional information that supports the use of other N_2O EFs that may be more representative of its specific conditions. In addition, the ERT encourages the Party to use the Wetlands Supplement in preparing its annual inventories for future annual submissions.	Yes. Accuracy
L.22	4 (IV) Indirect N_2O emissions from managed	The ERT noted that Iceland used the notation key "IE" to report on indirect N_2O emissions from managed soils in CRF table 4(IV) and that no quantitative data were reported for whole time series. During the review, Iceland indicated that these emissions are included in the agriculture sector. However, the ERT noted that, according to the information in the NIR (section 5.6.2, p.118), the amount of mineral fertilizers reported under the agriculture	Yes. Completeness

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
	soils – N_2O	sector in CRF table 3.D does not include the amount of fertilizer applied in forestry. The ERT recommends that Iceland estimate and report indirect N_2O emissions from managed soils, excluding those from agricultural lands that are reported in CRF table 3.D, and, in those cases where the notation key "IE" is used, indicate in the NIR and in the documentation box of the corresponding CRF table where in the inventory the emissions have been included and report information on the use of this notation in CRF table 9.	
L.23	4 (V) Biomass burning – CO_2, CH_4 and N_2O	The ERT noted that Iceland used the notation keys "NA", "NE" and "NO" to report information on AD, EFs and emissions for biomass burning in CRF table 4(V). During the review, Iceland explained that emissions from biomass burning should be reported as "NO" as controlled biomass burning does not occur in the country. The ERT recommends that Iceland correct the use of notation keys to report on emissions from biomass burning in CRF table 4(V).	Yes. Transparency
Waste			
W.12	5. General (waste)	In table 7.2 of the NIR, Iceland used the notation key "NE" for reporting information on the following GHGs and subcategories: N_2O emissions from managed waste disposal sites (5.A.1); N_2O emissions from unmanaged waste disposal sites (5.A.2); CO_2 emissions from biological treatment of solid waste (5.B); CO_2 emissions from domestic wastewater (5.D.1); and CO_2 emissions from industrial wastewater (5.D.2). During the review, Iceland indicated that the activities under those categories do not result in emissions for those specific gases and that the notation key "NA" should be used instead. Iceland further indicated that the use of notation keys will be corrected for the next annual submission. The ERT recommends that Iceland use the notation key "NA" in the NIR when reporting information on the following GHGs and subcategories: N_2O emissions from managed waste disposal sites (5.A.1); N_2O emissions from unmanaged waste disposal sites (5.A.2); CO_2 emissions from biological treatment of solid waste (5.B); CO_2 emissions from domestic wastewater (5.D.1); and CO_2 emissions from industrial wastewater (5.D.2).	Yes. Comparability
W.13	5.B.1 Composting – N_2O	The ERT noted that Iceland stated in the NIR (p.209) that it uses an EF of 0.3 g N_2O/kg waste treated (on a wet weight basis) as the default N_2O EF for composting. The ERT also noted that the default EF for estimating N_2O emissions from composting has been changed from 0.3 to 0.24 g N_2O/kg waste treated (on a wet weight basis) in the ninth corrigenda for the 2006 IPCC Guidelines (see https://www.ipcc-nggip.iges.or.jp/public/2006gl/corrigenda9.html). During the review, Iceland explained that the EFs used were from the IPCC EF database (see http://www.ipcc-nggip.iges.or.jp/EFDB/main.php). The ERT further noted that the N_2O EF for composting was not updated in the IPCC EF database in accordance with the ninth corrigenda for the 2006 IPCC Guidelines. The ERT recommends that Iceland estimate N_2O emissions from composting using the default N_2O EF for composting given in the ninth corrigenda for the 2006 IPCC Guidelines.	Yes. Accuracy

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[20] If yes, classify by type
KP-LULUCF			
KL.7	General (KP-LULUCF) – CO_2, CH_4 and N_2O	The ERT noted that Iceland did not report information on uncertainties associated with KP-LULUCF activities in accordance with the 2006 IPCC Guidelines. The ERT further noted that Iceland did not provide information on the uncertainty assessment in a sufficiently transparent manner (e.g. information on methods used for conducting uncertainty, underlying assumptions, data sources and documentation of expert judgments used to calculate uncertainties) for KP-LULUCF activities, namely, AR, deforestation, FM and HWP. The ERT recommends that Iceland provide in the NIR a description of the methodologies used for conducting an uncertainty analysis for KP-LULUCF activities (AR, deforestation, FM and HWP), including the methodology used in the uncertainty analysis of AD, EFs and emissions for each carbon pool.	Yes. Transparency
KL.8	General (KP-LULUCF) – CO_2, CH_4 and N_2O	The ERT noted that Iceland intended to apply zero values for the background levels for AR activities; however, the NIR does not provide information on approach used to develop background levels and margins for AR under Article 3, paragraph 3, and for FM under Article 3, paragraph 4, of the Kyoto Protocol, in accordance with decision 2/CMP.7. The ERT considers that when zero is applied for the background level, the Party needs to provide information in the NIR on the approach used and demonstrate how the approach avoids the expectation of net credits or net debits, in accordance with decision 2/CMP.7, annex, paragraph 33, including footnotes. In order to provide a rationale for using zero values for the background levels, the ERT is of the view that Iceland may wish to consider examples from countries with similar national circumstances, such as Sweden, which used the historical average of disturbances (low values close to zero) to set the background level. During the review, Iceland indicated that it will consider examples for developing background level and margin for AR activities from other countries with similar national circumstances. The ERT recommends that Iceland provide information in the NIR on the approach used to develop background level and margin values for FM and AR and demonstrate how the approach taken avoids the expectation of net credits or net debits, in accordance with decision 2/CMP.7, annex, paragraph 33. The ERT encourages Iceland to indicate in the NIR that technical corrections to the FMRL are expected to be carried out before the end of the second commitment period.	Yes. Transparency
KL.9	Afforestation and reforestation – CO_2	The ERT noted that Iceland used the notation key "NE" for reporting on CSC in the HWP pool under AR in the period 2013–2014. For the remainder of the time series (1990–2012 and 2015), Iceland did not report any information. During the review, Iceland explained that CSC should be reported using the notation key "NO" as harvesting from afforestation since 1990 has not yet occurred. The ERT accepted the explanation provided by Iceland. The ERT recommends that Iceland correct the use of notation keys by reporting CSC in the HWP pool under AR using the notation key "NO" for the whole time series and provide an explanation in the NIR that harvesting from afforestation lands has not yet occurred.	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[a]? If yes, classify by type*
KL.10	Forest management – CO_2	The ERT noted that Iceland used the notation key "NA" for reporting on losses of carbon in below-ground biomass under FM in the period 1990–2012, and the notation key "NE" for the period 2013–2015. The ERT further noted that Iceland did not provide justification that this carbon pool is not a net source. During the review, Iceland acknowledged that CSC in below-ground biomass should have been reported. The ERT recommends that Iceland report information on CSC in below-ground biomass for FM or provide justification that the carbon pool is not a net source in accordance with decision 2/CMP.8, annex II, paragraph 2(e).	Yes. Completeness
KL.11	Revegetation – CO_2	The ERT noted that the carbon stock in living and dead biomass as well as CSC in soils in revegetated land is not clearly estimated. During the review, Iceland informed the ERT that new CSC measurements in revegetated land have been conducted (see ID# L.19 above). The ERT considered that the new measurements may change the accounting results for RV. The ERT recommends that Iceland revise its estimates of carbon stock in living and dead biomass as well as carbon stock in soils in revegetated areas and revise its estimates of carbon sequestration in revegetated land for the whole time series.	Yes. Accuracy
KL.12	Harvested wood products – CO_2	The ERT noted that Iceland provided emission estimates from HWP in the NIR and in CRF table 4.G; however, information on AD for sawn wood production (production, imports and exports) in CRF table 4.G was reported as "NE". In addition, Iceland did not provide transparent information in the NIR on how the HWP from FM and deforestation were estimated. During the review, Iceland indicated that the information was not available and that it is making efforts to collect data using country-specific data sources. The ERT recommends that Iceland provide in the NIR information on the calculation of emissions from HWP, including the AD and methodology used, including information on HWP from FM and deforestation, as well as information on how Iceland distinguishes between domestic and imported HWP, in accordance with the requirements in decision 2/CMP.8, annex II, paragraph 2(g)(i).	Yes. Transparency

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problem.

VI. Application of adjustments

10. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of Iceland.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. Iceland has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2017 review.

VIII. Questions of implementation

12. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Iceland for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by Iceland

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by Iceland.

Table 6

Total greenhouse gas emissions for Iceland, base year[a]–2015

($kt CO_2 eq$)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–154.00
Base year	13 689.67	3 556.02	NA	NA	NA		–347.70	
1990	13 689.67	3 556.02	NA	NA				
1995	13 385.77	3 299.95	NA	NA				
2000	14 023.39	3 884.02	NA	NA				
2010	15 004.65	4 668.53	NA	NA				
2011	14 747.73	4 427.44	NA	NA				
2012	14 801.60	4 470.77	NA	NA				
2013	14 810.73	4 478.63	NA	NA		–179.90	–548.93	–79.42
2014	14 794.06	4 471.72	NA	NA		–201.14	–557.51	–82.83
2015	14 831.48	4 557.17	NA	NA		–251.14	–569.58	–82.24

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF_3, for which the base year is 1995. The base year for RV under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Iceland. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has not reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR and deforestation.

Table 7
Greenhouse gas emissions by gas for Iceland, excluding land use, land-use change and forestry, 1990–2015
(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	Unspecified mix of HFCs and PFCs	SF_6	NF_3
1990	2 158.08	523.41	378.45	0.34	494.64	NO, NA	1.10	NO, NA
1995	2 322.72	543.79	352.61	10.22	69.36	NO, NA	1.24	NO, NA
2000	2 767.86	563.60	358.07	43.28	149.89	NO, NA	1.31	NO, NA
2010	3 437.19	589.97	319.26	145.78	171.67	NO	4.66	NO
2011	3 337.11	572.31	295.95	144.50	74.52	NO	3.05	NO
2012	3 330.87	549.48	319.37	171.73	94.00	NO	5.32	NO
2013	3 341.25	552.15	313.95	179.91	88.16	NO	3.20	NO
2014	3 295.56	553.29	339.92	181.70	99.03	NO	2.22	NO
2015	3 369.00	556.06	319.91	206.98	103.70	NO	1.53	NO
Per cent change 1990–2015	**56.1**	**6.2**	**–15.5**	**59 899.3**	**–79.0**	**NA**	**39.5**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.
[a] Iceland did not report indirect CO_2 emissions in CRF table 6.

Table 8
Greenhouse gas emissions by sector for Iceland, 1990–2015
(kt CO_2 eq)

	Energy	IPPU	Agriculture	LULUCF	Waste	Other
1990	1 788.72	955.07	647.22	10 133.65	165.01	NO
1995	1 930.85	568.50	592.74	10 085.83	207.86	NO
2000	2 050.39	1 005.45	598.30	10 139.38	229.87	NO
2010	1 873.66	1 948.59	599.92	10 336.12	246.36	NO
2011	1 773.29	1 843.18	580.15	10 320.30	230.81	NO
2012	1 720.81	1 935.20	603.03	10 330.83	211.73	NO
2013	1 705.47	1 961.03	590.60	10 332.10	221.52	NO
2014	1 694.86	1 940.49	628.99	10 322.33	207.38	NO
2015	1 710.10	2 022.58	617.49	10 274.30	207.00	NO
Per cent change 1990–2015	**–4.4**	**111.8**	**–4.6**	**1.4**	**25.4**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Iceland did not report indirect CO_2 emissions in CRF table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for Iceland
(kt CO_2 eq)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–154.00				
Technical correction				NE				
Base year	NA				NA	NA	–347.70	NA
2013		–180.05	0.16	–79.42	NA	NA	–548.93	NA
2014		–201.25	0.11	–82.83	NA	NA	–557.51	NA
2015		–251.36	0.22	–82.24	NA	NA	–569.58	NA
Per cent change base year–2015					**NA**	**NA**	**63.8**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] The base year for RV under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Iceland. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for Iceland's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10
Key relevant data for Iceland under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) FM: commitment period accounting
	(d) CM: not elected
	(e) GM: not elected
	(f) RV: commitment period accounting
	(g) WDR: not elected
Election of activities under Article 3, paragraph 4	RV
Election of application of provisions for natural disturbances	Yes, for AR and FM
3.5% of total base-year GHG emissions, excluding LULUCF	127.175 kt CO_2 eq (1 071.396 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Information to be included in the compilation and accounting database

Tables 11–13 include the information to be included in the compilation and accounting database for Iceland. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for Iceland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	13 794 496			13 794 496
Annex A emissions for 2015				
CO_2	3 368 998			3 368 998
CH_4	556 058			556 058
N_2O	319 907			319 907
HFCs	206 977			206 977
PFCs	103 704			103 704
Unspecified mix of HFCs and PFCs				
SF_6	1 530			1 530
NF_3				
Total Annex A sources	**4 557 174**			**4 557 174**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	−251 361			−251 361
3.3 Deforestation	224			224
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	−82 237			−82 237
3.4 RV	−569 581			−569 581
3.4 RV in the base year	−347 705			−347 705

Table 12
Information to be included in the compilation and accounting database for 2014, for Iceland
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2	3 295 557			3 295 557
CH_4	553 293			553 293
N_2O	339 921			339 921
HFCs	181 699			181 699
PFCs	99 034			99 034
Unspecified mix of HFCs and PFCs				
SF_6	2 216			2 216

	Original submission	*Revised estimates*	*Adjustment*	*Final*
NF_3				
Total Annex A sources	**4 471 721**			**4 471 721**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–201 249			–201 249
3.3 Deforestation	111			111
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–82 833			–82 833
3.4 RV	–557 511			–557 511
3.4 RV in the base year	–347 705			–347 705

Table 13
Information to be included in the compilation and accounting database for 2013, for Iceland
($t CO_2$ eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2	3 341 254			3 341 254
CH_4	552 149			552 149
N_2O	313 951			313 951
HFCs	179 906			179 906
PFCs	88 165			88 165
Unspecified mix of HFCs and PFCs				
SF_6	3 202			3 202
NF_3	NO			NO
Total Annex A sources	**4 478 626**			**4 478 626**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–180 051			–180 051
3.3 Deforestation	155			155
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–79 423			–79 423
3.4 RV	–548 934			–548 934
3.4 RV in the base year	–347 705			–347 705

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

(a) CO_2 emissions from the use of CH_4 collected from waste yards in road transportation (see ID# E.26 in table 5);

(b) CH_4 and N_2O emissions from the use of charcoal (see ID# E.27 in table 5);

(c) CO_2 emissions from other uses of carbonates (see ID# I.11 in table 5);

(d) F-gas emissions from, for example, fire extinguishers and other aerosol products (see ID# I.13 in table 5);

(e) N_2O emissions from sewage sludge applied to soils (see ID# A.4 in table 3);

(f) N_2O emissions from mineral soils (see ID# A.5 in table 3);

(g) CSC in mineral soils under cropland remaining cropland (see ID# L.5 in table 3);

(h) CO_2 emissions from degraded areas of grassland (see ID# L.9 in table 3);

(i) CSC in mineral soils under land converted to wetlands (see ID# L.11 in table 3);

(j) CSC in mineral soils under land converted to settlements (see ID# L.12 in table 3);

(k) N_2O emissions from N mineralization associated with the loss of soil carbon resulting from land converted to settlements (see ID# L.13 in table 3);

(l) CSC in deadwood and litter carbon pools under forest land (see ID# L.17 in table 5);

(m) Indirect N_2O emissions from managed soils, excluding those from agricultural lands that are reported in CRF table 3.D (see ID# L.22 in table 5);

(n) CH_4 and N_2O emissions from sludge (see ID# W.8 in table 3);

(o) CSC in below-ground biomass for FM (see ID# KL.10 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/gp/english/.

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IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies.
Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC.
Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual review of the 2013, 2014, 2015 and 2016 annual submissions of Iceland, contained in documents FCCC/ARR/2013/ISL, FCCC/ARR/2014/ISL, FCCC/ARR/2015/ISL and FCCC/ARR/2016/ISL, respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Aradottir AL, Svavarsdottir K, Jonsson PH and Gubergsson G. 2000. Carbon accumulation in vegetation and soils by reclamation of degraded areas. *Buvisindi*. (13): pp.99–113.

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European Environment Agency. 2016. EMEP/EEA *air pollutant emission inventory guidebook 2016*. Available at
https://www.eea.europa.eu/publications/emep-eea-guidebook-2016.

Gudmundsson J, Gisladottir FO, Sigmundur HB and Oskarsson H. 2010. *The Icelandic Geographic Land Use Database (IGLUD)*. Conference paper. Available at
http://www.skogoglandskap.no/publikasjon/mapping_and_monitoring_of_nordic_vegetation_and_landscapes_conference_proceeding.

NEA. 2010. *Geothermal Development and Research in Iceland*. Available at
http://www.nea.is/media/utgafa/GD_loka.pdf.

NEA. 2015. *Energy Statistics in Iceland 2015*. Available at http://os.is/gogn/os-onnur-rit/Orkutolur_2015-enska-utfaersla2.pdf.

Orkustofnun. 2011. *Gaslosun jarðvarmavirkjana á Ís.andi 1970–2009*. Available at http://www.os.is/gogn/Skyrslur/OS-2011/OS-2011-02.pdf.

Status report of the annual inventory of Iceland. Available at http://unfccc.int/resource/docs/2017/asr/isl.pdf.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Hellsing, Mr. Jonsson, Ms. Keller and Ms. Ragnarsdottir (Environment Agency of Iceland), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Iceland:

Gudmundsson J. 2009. Losun hláturgass og annarra gródurhúsalofttegunda úr lífrænum jardvegi vid mismunandi landnotkun (Emissions of nitrous oxide gas and other greenhouse gases from organic soils for different land use). Projektnumber 060236023. Report to the Icelandic research council.

[1] Reproduced as received from the Party.